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1896

M. VEITCHIANA.

THE GENUS MASDEVALLIA.

ISSUED BY

THE MARQUESS OF LOTHIAN, K.T.,

CHIEFLY FROM PLANTS IN HIS COLLECTION OF ORCHIDS AT NEWBATTLE ABBEY;

PLATES AND DESCRIPTIONS BY

MISS FLORENCE H. WOOLWARD;

WITH ADDITIONAL NOTES BY

F. C. LEHMANN

(GERMAN CONSUL IN THE REPUBLIC OF COLOMBIA).

WITH 87 PLATES, AND 61 WOODCUTS FROM PHOTOGRAPHS.

INDEX AND MAP.

1896.

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TO

HER MAJESTY THE QUEEN.

ERRATA:

Under M. Macrura: in ref. to Gard. Chron. 1881, for 136 read 336.

Under M. Aristata: dele. ref. to Gard. Chron. 1881.

Under M. Reichenbachiana: for Frazú read Irazú.

PREFACE.

THE increasing interest taken in the genus Masdevallia, and the large number of species now in cultivation, seemed to form a sufficient reason for publishing the present Monograph, which will be made as complete and exhaustive as the numerous difficulties attendant upon such an undertaking will allow. One of the greatest of these difficulties arises from the impossibility of referring to the late Professor Reichenbach's immense collections of dried specimens, drawings, and unpublished descriptions, now sealed up, by the eccentric conditions of his Will, in the Vienna Museum for a period of 25 years from the date of his death, 1889. In thus rendering his collections inaccessible, Professor Reichenbach has precluded any comparison with many types of the genus Masdevallia, of which the greater number of species were first named and described by him.

The drawings contained in the earlier Parts of this work will be prepared from Plants grown at Newbattle Abbey; those in subsequent Parts will be taken from specimens liberally contributed by many persons interested in the genus. Besides a hand-coloured lithograph (natural size) of each species in cultivation, a vignette engraving from a photograph will be given, except in those cases where it is found impossible to obtain a photograph of the perfect plant. Drawings also of numerous species entirely unknown in this country, or known hitherto only as dried specimens, are generously promised by Consul F. C. Lehmann, whose exceptional advantages as a skilled botanist collecting for many years in those regions of Central and South America where alone Masdevallias are to be found, place him at the head of the authorities upon the genus. His drawings will be published in later Parts of the work, with names and descriptions supplied by him, and with a chapter on the geographical distribution of the genus, accompanied by a map. For each species which he has himself collected, he contributes a note stating the temperature and elevation of the locality in which he has found the plant.

The Plates issued in each Part will be arranged—for temporary convenience—in alphabetical order, and at the end of the work a synopsis will be given, indicating the sections into which the genus is divisible, and the order in which the entire book should be bound.

Much pleasure is felt in thanking numerous friends for the help which they have given towards the progress of the work, especially those gentlemen on the Botanical Staff of the British Museum of Natural History, whose kind and willing aid has greatly lightened the task of preparing the text. Thanks are also due to Mr. F. W. Moore, of the Royal Botanic Gardens, Glasnevin, Dublin, for sending many rare specimens, which have proved of invaluable assistance in the completion of the Plates. Sir Trevor Lawrence, Bart., M.P., Mr. Sydney Courtauld, Mr. Harry Veitch, and Mr. James O'Brien have also been most generous in supplying useful specimens.

It may be of interest to friends of the late Professor Reichenbach to know that some of the first Plates prepared for this work were submitted to him shortly before his death, and that they met with his cordial approbation. By his advice a few slight additions were made in the dissections, as for instance, the apex and section of each leaf and the apex of the column.

Florence H. Woolward,
Belton,
Grantham.

(1890.)

THE

GENUS MASDEVALLIA;

ITS HISTORY,

GEOGRAPHICAL DISTRIBUTION, ETC.

IN writing the history of the Genus *Masdevallia*, there is little to be added to the information already published. A few new species have been recently discovered and introduced to horticulture, but the keen interest in them which prevailed a few years ago, especially during the lifetime of Professor Reichenbach, has almost died out, and we no longer hear of fabulous prices paid for a fragment of a plant, consisting, perhaps, of only two or three leaves. This interest, which almost amounted to a mania, was, no doubt, partly caused by Reichenbach's glowing and grotesque descriptions of the new species brought to his notice, for, since his death, it is remarkable that purchasers have been less eager to buy, and dealers consequently less enterprising in collecting, while the reduction of prices has brought even rare species within the means of almost every horticulturist.

The first *Masdevallia* known to science was *M. uniflora*, which was discovered by the Spanish botanists, Ruiz and Pavon, in the Andes of Peru, during their residence in that country from 1777 to 1794, for the purpose of exploring the Cinchona forests in the interests of the Spanish Government. They founded upon it a new Genus in honour of their fellow-countryman Josepho Masdevall, a physician at the Court of Spain. *M. uniflora* has never since been seen in its native habitat by any botanist, and only the most persistent enquiry has enabled me to collect the details of its history given in this work, with the first coloured drawing of the plant ever made. No other examples of the new Genus were made known until 1809, when *M. infracta* was discovered in Brazil by Descourtilz, a French botanist and traveller, and this species, of which living plants were imported in 1828, was the first to flower in cultivation. In 1833 *M. Caudata* was discovered, and during the next twelve or fourteen years several other species, and from that time onwards their number has steadily increased, until, at the present time, between eighty and ninety are cultivated, and many others are known as Herbarium specimens or by description only.

The geographical distribution of the Genus extends from Mexico, in about 20° N. lat., south-eastwards through the central Cordillera of Costa Rica, and the Isthmus of Panama, then running north-eastwards as far as the coast ranges of Venezuela, and southwards towards its centre in the Andes of Colombia. The southern limit on the western side of the continent is reached in the Peruvian Mountains at 16° or 17° S. lat., and on the eastern side in the Organ Mountains of Brazil, at 23° S. lat., where nine or ten species have been discovered. One is recorded from Mount Roraima, two or three from the hills of French and Dutch Guiana, and one only from the low alluvial region in the interior of the continent, the habitat of which is indicated on the annexed map by Senhor Rodriguez, hitherto the only discoverer of a *Masdevallia* so far from the sea-coast. The principal part of the area of geographical distribution—marked in yellow on the map—was indicated by Consul Lehmann himself, and may therefore be relied on as accurate.

Masdevallias have a very remarkable vertical range, extending almost from the level of the sea, where Consul Lehmann has found them upon the trunks and roots of trees growing close to the shores of the Pacific Ocean, and from 195 feet in the marshy inland forests of Brazil, the habitat of *M. Yauaperyensis*, to 12,000 feet in the mountains of Peru and Colombia, where the brilliantly-coloured species of the Section *Coccineæ* abound, and 14,500 feet in the Andes of Popayán, the home of *M. Racemosa*.

In the more elevated regions in which Masdevallias are found, above the limit of forest-trees and almost at the snow-line, the climate is characterised by hot sunshine and high-winds during the day, with thick fogs and a low temperature, often below the freezing point, at night, while violent storms of rain and hail are frequent. The species found in these localities are terrestrial, growing in crevices of volcanic rocks and in the shade of the low shrubs which cover the hill-sides. At a lower elevation, among the dense forests of Colombia and Ecuador, Masdevallias are very numerous, and are mostly epiphytal plants, growing on the trunks and branches of trees among thick mosses, or in hollows where vegetable soil has accumulated. The climate of the forest region is excessively damp and misty; drenching rains occur daily and cause dense fogs, which envelope the hills during the morning hours, but the temperature is warmer and more uniform than that of the higher mountains, without extremes of heat and cold, and ranging from about 48° to 77° Fahrenheit. The highest temperature hitherto recorded for any *Masdevallia* is 78° to 84° Fahrenheit in the low damp forests of the interior of Brazil, where *M. Yauaperyensis* is found.

Although the cultivation and climatic conditions of Masdevallias are now fairly well understood, it is hoped that the particulars as to altitude, temperature, and climate, given by Consul Lehmann in his notes on most of the species collected by him, will be of use to those who wish to give their plants the treatment suited to their requirements, so far as this can be done by artificial means. In the case of many of the recently imported species there is a deplorable want of information upon these important points, a contrast to the careful field-notes made by botanists such as Linden, Roezl, etc. The Orchid-collectors of the present day are mostly sent out by dealers, who, fearful lest any rival should share their profits, conceal even the name of the habitat of new species, and allow their emissaries to send home plants without any particulars as to the elevation and climatic conditions of the localities in which their discoveries were made.

The variation of many Masdevallias is considerable, especially in the case of *M. Chimœra*, a polymorphic plant upon which alone an entire monograph might be written. Seven or eight of its varieties were named by Professor Reichenbach as distinct species, but are now, owing to the large number of intermediate forms since introduced, acknowledged in their true position. The comparatively wide geographical range of this species—extending over 400 miles in the mountains of Colombia—and the consequent differences of soil, situation, and climate, to which it must be exposed, cannot be assigned as the reason for its extreme variability, for Consul Lehmann has found several varieties growing together in the same habitat, and all therefore sharing in similar climatic conditions. Varieties of *M. coccinea* and *M. militaris* are also to be found growing together in thousands in one locality, covering the hill-sides with brilliant and divers colours.

So little is known of the methods of fertilisation of *Masdevallia* flowers in a wild state, or of the insects which probably effect it, that we can only surmise the uses of the structural peculiarities to be observed in the different species. Only the closest attention, night and day, in the natural habitat of the plants, could elucidate this obscure subject, and although Consul Lehmann has attempted to pursue the matter during his long residence in Central and South America, and probably knows more about it than any other botanist, the record of his investigations has been so long delayed that it will not be available for the present work. The mossy hairs on the stem of *M. muscosa*, each tipped with a tiny drop of viscid matter, may be supposed to act as a protection against the incursions of crawling insects, while the sensitive and mobile lip, closed at night and open during the day, shows that the insect necessary for the fertilisation of this flower must be a diurnal one. In the flowers of *M. elephanticeps*, the strong odour of tainted meat, given out especially towards evening, may be intended to allure some kind of nocturnal fly or beetle. Honey is contained in the nectarines at the base of the lip in many species of the *Coriaceæ* Section, and probably forms an attraction to bees or moths, which, in inserting their proboscis into the depths of the

flower, would easily remove the pollinia and would then transport them to the flowers of another plant. In other species the texture of the whole flower, or of some especial part, is juicy and succulent, and possibly acts as an allurement to insects. The internal organs of the flowers of the *Coccineæ* Section are extremely small, scarcely visible within the deep narrow sepal-tube, but the broadly-extended sepals are brilliantly coloured for the attraction of insects, which, after alighting upon them would perhaps discover the curious viscid substance to be found in the angle of the petals, and in attempting to reach this, or in struggling to escape from the narrow trap into which they had forced their way, must inevitably carry away the pollinia, repeating the same manœuvres in the flowers of other plants. Many more suggestions might be made as to the manner in which the important process of fertilisation is effected, but in the present lack of local observations upon the subject, no information can be given. In a wild state, Masdevallias appear to ripen seed freely, for a great many of the dried specimens which I have examined showed well-developed seed-capsules. In cultivation the flowers are easily amenable to hybridisation, but the hybrids raised by artificial means are too numerous to be figured in this work, and only a few are mentioned. Those who take an interest in them will find their merits fully set forth in the dealers' catalogues of the day.

The plants from which my drawings were made were not chosen as fine horticultural specimens, but may be considered, on the whole, to be of fair average size and colour. I have endeavoured to make each Plate as complete as possible, giving, in all except four, a drawing of buds more or less advanced in growth, as well as several different views of the perfect flower. In some of the Plates the colouring is not quite so clear and bright as I could have wished. Only a drawing direct from the flowers could give the delicate effects to be seen in nature, the grey shading of the lithograph unavoidably detracting from the brilliancy of the colours laid over it. It is no doubt advantageous in botanical work or in any similar drawing demanding great exactness, that the person who makes the original drawing from nature should also lithograph the Plates and indicate the colours to be used by the colourist, for, by this means, the work passes through fewer hands and is more likely to turn out accurate. I have therefore pursued this method throughout the present work, and have, besides, touched up the colouring of every Plate sent out, numbering nearly 9,000. It may be noticed that the dissections of internal parts of the flowers given in my drawings are uniform, a system intended to facilitate the comparison of the structure of one species with that of another —often rendered impossible by the want of uniformity in botanical Plates. The photographs from which the woodcuts were made were taken by different persons, and are, therefore, not on one scale, or meant for comparison with each other, but with the natural size of the plant as represented in the corresponding Plate. The woodcuts were executed by Messrs. W. and J. R. Cheshire, of 23, Holborn Viaduct, and I would specially draw attention to those of *M. Chimæra var. Backhousiana* and *M. Houtteana*, which show wonderfully delicate and careful work. It has proved impossible to give a woodcut of every species in cultivation, as was at first proposed. Some of the plants are very rare, and exist in such small pieces only, that the entire plant can be fully represented in the coloured Plate. Of the eighty cultivated species and varieties figured, sixty-three are from the Marquess of Lothian's collection of Orchids at Newbattle Abbey, and one of these, *M. fragrans*, is a new species. Another new species, *M. fractiflexa*, is from a drawing by Consul Lehmann and has not yet been imported alive. We also publish drawings of six plants hitherto known by name only, three of them from Brazil, discovered, drawn and described by Senhor Rodriguez, Director of the Botanic Gardens, at Rio de Janeiro; one, a drawing of *M. uniflora*, sent from Madrid by Dr. Miguel Colmeiro; and two drawn by Consul Lehmann, of species not yet known in cultivation, although described years ago by Professor Reichenbach. Many of the remainder of the plants have never before been drawn.

Although the plan of dividing the Genus into Sections was originated by Professor Reichenbach, he often omitted, in describing a new species, to state the Section or

group in which he thought it should be included, and never attempted to arrange the entire series of groups in any systematic order. This can, perhaps, hardly be done until a wider knowledge of the Genus is attained, and I have, therefore, for convenience, numbered the Sections and placed them and the species contained in them in alphabetical order. The index refers to the number and name of the Section in which each species will be found. In the case of those plants of which it is impossible, from the original description, to ascertain the affinities, a list is given on a separate page, and they are referred to in the index under "*Section indeterminate.*" The names of those species now excluded from the Genus *Masdevallia* are also mentioned on a separate page, and are, in the index, followed by the name of the Genus in which they have been placed. Much doubt and uncertainty about these and other species will be set at rest only when Professor Reichenbach's vast collections of dried plants, drawings and notes, come to light in the Vienna Museum, where, according to the extraordinary conditions of his will, they must remain untouched for 25 years after the date of his death, which took place in 1889. Until this period has elapsed, therefore, all arrangements of Sections, and determinations of species or varieties, must be made with reserve and regarded as temporary and uncertain.

Many interesting species will be added to the Genus when Consul Lehmann publishes his large series of drawings, made in the natural habitat of the plants. It was originally proposed that more of his drawings should be included in the present work, but many of those lent to me by him for that purpose, although in themselves excellent, were sent without dissections, names, notes, or descriptions, and were, therefore, useless for publication. It is only possible to indicate upon the map a very few of the places mentioned in his notes, many of them being small remote towns and villages, or minor mountain-peaks and valleys in the vast Cordilleras of the Andes.

To the numerous friends whose assistance has enabled me to accomplish this work, I must again express sincere and grateful thanks, and in addition to those mentioned in the preface I wish to thank the members of the Staff of the Royal Herbarium at Kew, who have given me their help, as well as Mr. F. Sander and Mr. R. J. Measures, who have supplied me with information and specimens. For the loan of an excellent collection of dried plants, as well as for living specimens, I am indebted to Monsieur Eugène Autran, of the Boissier Herbarium at Chambésy, Geneva. In conclusion, I may remark that in carrying out the work of this book, I have spared no pains, and have done my best in every way to obtain accurate information and drawings, although, being neither a trained artist nor botanist, I have felt myself hardly qualified for the undertaking.

Belton,

August, 1896.

MAP OF CENTRAL AND SOUTH AMERICA

Showing the Geographical Distribution of the

GENUS MASDEVALLIA

English Miles

Kilometres

Showing the Geographical Distribution of the Genus Masdevallia.

GULF OF MEXICO
MEXICO
GUATEMALA
HONDURAS
S. SALVADOR
NICARAGUA
COSTA RICA
PANAMA
Gulf of Panama
Gulf of Darien
CUBA
JAMAICA
Greater Antilles
CARIBBEAN SEA
Lesser Antilles
PUERTO RICO
Dominica
Martinique
Guadeloupe
Antigua
Barbuda
Barbados
Grenada
Tobago
Trinidad
ATLANTIC OCEAN
COLOMBIA
(NEW GRANADA)
Terr. Del Caqueta
Bolivar
Boyaca
Cundinamarca
Antioquia
Cauca
Magdalena
Maracaibo L.
Guzman Blanco
Bermudez
Caldonazo Blanco
Yuruari Ter
Amazonas Terr
Alto Orinoco Terr
S. Martin Terr
Cocos I.
Galapagos Is
Albemarle I
Charles I.
Hood I.
Chatham I.
Abingdon I.
Narborough I.
Culpepper I.
Wenman I.
James I.
Indefatigable I.
ECUADOR
Oriente
G of Guayaquil
PERU
Loreto
Amazonas
Libertad
Lima
Callao
Cuzco
El Beni
Arequipa
Ica
Ayacucho
Junin
Huancavelica
Huanuco
Moquegua
Tacna
Arica
Tarapaca
Puno
Titicaca L.
Santa Cruz
Chuquisaca
Tarija
Potosi
Oruro
La Paz
BOLIVIA
ARGENTINA
PARAGUAY
Concepcion
Salta
Jujuy
Antofagasta
Atacama
Cobija
Iquique
Chinchas Is
Lobos Is
Puna I.
Trujillo
Piura
Lambayeque
Huanuco
Huancavelica
Ayacucho
Junin
Callao
Lima
Cuzco
Puno
Arequipa
Moquegua
Tacna
Arica
Tarapaca
Iquique
Antofagasta
Atacama
Cobija
Oruro
Potosi
Chuquisaca
Tarija
Santa Cruz
El Beni
Matto Grosso
Amazonas
Para
Maranhão
Piauhy
Ceara
Rio Grande del Norte
Parahyba
Pernambuco
Alagoas
Sergipe
Bahia
Minas Geraes
São Paulo
Rio de Janeiro
Espirito Santo
Goyaz
Paraguay
Parana
Matto Grosso
Guyaba
Cuyaba
Diamantina
Philadelphia
Victoria
Caravellas
Abrolhos
C. Frio
C. S. Roque
Rio de Janeiro
S. Paulo
Santos
Salto Guaira
Salto Augusto
Salto Apiacas
Apuè Falls
Borba
Manoas
Teffe
Tabatinga
Iquitos
Nauta
Loreto
Pebas
Yurimaguas
Chachapoyas
Moyobamba
Huamachuco
Huaraz
Huanuco
Huancayo
Ayacucho
Cuzco
Arequipa
Puno
Titicaca L.
La Paz
Oruro
Potosi
Sucre (Chuquisaca)
Tarija
Jujuy
Salta
Concepcion
Asuncion
Villa Rica
Santiago
Corumba
Uberava L.
Matto Grosso
Diamantino
Cuyaba
Guyaba
Goyaz
Palmas
Barra
Porto Imperial
Porto Velho
Salto Augusto
Salto Apiacas
Borba
Manoas
Santarem
Obidos
Tumucumaque
Tumac Humac
Paramaribo
New Amsterdam
Georgetown
Demerara
Essequibo R.
Roraima
Pacaraima
(BRITISH) GUYANA
(DUTCH) GUYANA
(FRENCH) GUYANA
Cayenne
Oyapock
Marajo I.
Para
Belem
Maranhão
Ceara
Fortaleza
Natal
Rio Grande del Norte
Parahyba
Pernambuco
Recife
Alagoas
Maceio
Sergipe
Bahia
Caravellas
Abrolhos
Victoria
Espirito Santo
Rio de Janeiro
C. Frio
S. Paulo
Santos
Campanha
Caldas
Ouro Preto
Itacolumi
Diamantina
Philadelphia
Minas Geraes
Goyaz
Paraguay
Parana
Matto Grosso
Guyaba
Cuyaba
Diamantino

SECTION I.

AMANDÆ Rchb. f.

THIS Section contains five species in cultivation, and several others known only as dried specimens. It was founded by Reichenbach upon *M. Amanda*, a plant discovered by Warscewicz in 1853, near Ocaña, and more recently met with by other collectors in different parts of Colombia and Antioquia. I can hear of no living specimen of this plant. All the species in the Section *Amandæ* are much alike in outward appearance, as well as in internal structure. The stems of all produce several small flowers, the wings or ridges upon the ovary are serrated, and the petals are toothed upon both margins.

5 species figured :

Masdevallia abbreviata Rchb. f.
caloptera Rchb. f. (=*M. biflora Regel*)
melanopus Rchb. f.
pachyura Rchb. f.
polysticta Rchb. f.

Not in cultivation :

M. Amanda Rchb. f. et Warsc. Bonplandia II. (1854), p. 115.
anachæte Rchb. f. Otia. Bot. Hamb. (1878), p. 17.
calopterocarpa Rchb. f. Flora (Singer) 1886, p. 560.
Gustavi Rchb. f. Gard. Chron. 1875, pt. I., p. 461.
Lehmanni Rchb. f. Gard. Chron. 1877, pt. II., p. 38.
tridens Rchb. f. Otia. Bot. Hamb. (1878), p. 13.
xanthodactyla Rchb. f. Gard. Chron. 1877, pt. II., p. 552.

Florence H. Woolward del. et lith. 1891.

M&N. Hanhart, imp.

MASDEVALLIA ABBREVIATA *Rchb. f.*

MASDEVALLIA ABBREVIATA Rchb. f.

MASDEVALLIA ABBREVIATA Rchb. f. Gard. Chron. 1878, pt. II., p. 106 ; 1881, pt. II., p. 236 ; Bot. Mag. t. 6258 (1876) *as M. polysticta* Rchb. f. *(M. melanopus* Rchb. f. fide Hooker, Bot. Mag. t. 6368 (1878) under *M. polysticta)* ; Orchidophile (Godefroy) vol. I. (1881-3), p. 83.

Leaf 5 or 6 inches long, oblong-lanceolate, apex tridenticulate, bright green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle 6 or 7 inches long, terete, slender, ascending from within a sheath at the base of the petiole, green, many-flowered ; flowering bracts about $\frac{1}{4}$ inch long, sheathing the pedicel and the base of the ovary, brownish.

Ovary $\frac{1}{8}$ inch long, triangular, with six crenate wings, pale green.

Sepals all cohering for about $\frac{1}{4}$ inch, forming a rounded tube, gibbous below, free portions ovate-triangular for about $\frac{3}{16}$ inch, 3-nerved, margins serrate, white, more or less spotted with pinkish-crimson, and terminating in slender terete tails, bright yellow tipped with orange.

Petals a little more than $\frac{1}{8}$ inch long, linear at the base, obcordate, apiculate, margins sharply serrated, with a fleshy angled keel on the anterior margin, pure white.

Lip longer than the petals, grooved at the base and united to the curved foot of the column by a flexible hinge, lateral lobes oblong, narrowing towards the central lobe, with two longitudinal keels, apex trilobed, pale yellow.

Column a little shorter than the petals, green, with crimson apex and wings and a few spots, foot white with crimson spots, apex sharply denticulate.

ALTHOUGH Professor Reichenbach's first description of *M. abbreviata* was not published until 1878, the plant was probably known and cultivated in Europe for some years previously, in perhaps more than one variety, and under the name of *M. melanopus.* No record of its habitat was given by Bruchmüller or Roezl, but there seems no doubt that one of these collectors discovered it in North Peru. Reichenbach suggests that it is perhaps a hybrid between *M. polysticta* and *M. melanopus,* and states also that there is "a nearly unspotted variety." It appears, however, to be a true species, and probably its extreme variability helps to account for the confusion that exists between it and *M. melanopus,* although it never approaches the very rare and distinct form of that species figured in the present work.

The Plate published in the Botanical Magazine in 1876 (t. 6258) as *M. polysticta* was afterwards supposed (Bot. Mag. t. 6368, 1878) by Sir Joseph Hooker to be *M. melanopus,* but in the Royal Herbarium at Kew there is a letter from Professor Reichenbach, attached to dried specimens of *M. abbreviata,* in which he says: "The

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Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip, front view ;—3a, lip, side view ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size.*

elder *polysticta*" (that is, the plant figured in 1876, Bot. Mag. t. 6258) "is, I have no doubt, what I call *abbreviata*."

The distinguishing features of the two plants are: In *M. abbreviata* the bracts are larger and more ample than those of *M. melanopus*, while the flowers are rounder and wider, the edges of the sepals being serrated; the tails of *M. abbreviata* are rounded, while those of *M. melanopus* are flat; to these characteristics may be added the remarkable one-sided growth of the flowers of *M. melanopus*, specially mentioned by Professor Reichenbach in describing that species, and never seen in any form or variety of *M. abbreviata*, the flowers of which are placed in no regular position upon the stem. The internal organs, also, of *M. abbreviata*, as will be seen by comparing the two Plates published in the present work, differ from those of *M. melanopus* both in structure and colouring.

It is curious that the name *abbreviata* seems to have entirely disappeared from most collections, the name *melanopus* being substituted for every form and variety of *M. abbreviata*; and I have received innumerable specimens under the name *melanopus* which were in fact *abbreviata*.

The plant from which the accompanying drawing was taken has existed in the collection of the Marquess of Lothian at Newbattle Abbey since 1879 under the name of *M. abbreviata*, and is probably one of the few which remain, correctly named, of the original importation from Peru by Mons. Ortgies, of Zürich.

Florence H Woolward del et lith 1894

MASDEVALLIA CALOPTERA *Rchb. f.*

MASDEVALLIA CALOPTERA Rchb. f.

MASDEVALLIA CALOPTERA Rchb. f. Gard. Chron. 1874, pt. I., p. 338 *(nomen tantum)*; pt. II., p. 322; 1875, pt. II., p. 290; 1878, pt. I., p. 104; 1881, pt. II., p. 236; Illustr. Hort. XXI. (1874), p. 60.

M. biflora, Regel in Gartenflora vol. I. (1891), t. 1341, fig. 2.

Leaf about 3 inches long, oblong-ovate, tridenticulate, carinate, narrowing below into a slender grooved petiole, sheathed at the base, bright green, the older leaves tinged with rust red.

Peduncle 4 or 5 inches long, terete, slender, ascending from within a sheath at the base of the petiole, many-flowered, with sheathing bracts, pale green; flowering bracts minute, apiculate, dull green.

Ovary $\frac{1}{8}$ inch long, triangular, with six crenate wings, almost covered by the bract, green spotted with crimson.

Sepals cohering for nearly $\frac{1}{4}$ inch, forming a narrow tube, gibbous below; dorsal sepal roundly triangular, cucullate, carinate at the back, margins minutely serrate; lateral sepals oblong, margins recurved; all white, with crimson streaks, 3-nerved, terminating in slender tails nearly $\frac{1}{2}$ inch long, orange-yellow.

Petals $\frac{3}{16}$ inch long, oblong, acuminate, margins rounded and denticulate, white, with one prominent crimson keel near the anterior margin.

Lip a little longer than the petals, grooved at the base and united to the curved foot of the column by a flexible hinge, with two oblong lateral lobes, and two longitudinal keels terminating in a rounded central cushion, apex slightly recurved, trilobed, yellow, with longitudinal crimson lines and spots, apex orange-yellow.

Column a little shorter than the petals, winged, apex bidentate, pale green, the foot and wings crimson.

MASDEVALLIA CALOPTERA was discovered by Roezl in the Northern Andes of Peru, growing in thick masses mixed with plants of *M. polysticta* and *M. melanopus*. This remarkable proximity of numerous species of one section is again noticed by Consul Lehmann under *M. pachyura*, and may perhaps account for the origin of varieties and natural hybrids, some of which have received specific names. Roezl's dried specimens of *M. caloptera* were named and described by Professor Reichenbach in 1874, and it was not until the last few years that living plants were imported. These were distributed under incorrect names, as *M. pachyura* and *M. biflora*, the latter name being published by Regel in his Gartenflora, with a coloured figure of a small specimen of *M. caloptera*.

A note from Consul Lehmann upon *M. abbreviata*—received too late for publication with our Plate of that species—may be inserted here. He mentions several localities in which he also found *M. polysticta* and *M. melanopus*, the identical species found by Roezl growing with *M. caloptera*. The region is evidently the same as that explored by Roezl during his discoveries.

Masdevallia abbreviata is confined to a comparatively small area in Northern Peru and Southern Ecuador, at an elevation of 1,800 to 2,000 mètres (5,850 to 7,150 feet). It grows on trees, overgrown with mosses, lichens and epiphytes, in the thick damp woods which surround the Mountains of Amboca, Catacocha, Gonzanamá, Cariamanga, Hutiana, and Sabiango. These mountain-chains branch off partly from the Huaira-urcu and partly from the Nudo de Savanilla, in the province of Loja, gradually sloping in a south-westerly direction towards the dreary deserts of Northern Peru. The climate of this region is damp and foggy throughout almost the whole year. Even during the dry season, which only lasts from the beginning of July to the end of September, heavy mists envelope the forests every morning and evening. The annual mean temperature ranges between 15°.5 and 17° centigrade (about 59° to 63° Fahrenheit).

Explanation of Plate, drawn from specimens sent by Mr. Sidney Courtauld and Mr. F. W. Moore:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal;—3, lip, front view;—3a, lip, side view; 4, column; 4a, apex of column; *all enlarged.*

Florence H.Woolward del.et lith. 1892.

Hanhart imp

MASDEVALLIA MELANOPUS *Rchb. f.*

MASDEVALLIA MELANOPUS Rchb. f.

MASDEVALLIA MELANOPUS Rchb. f. Gard. Chron. 1874, pt. I., p. 338 (*nomen tantum*); pt. II., p. 322; 1875, pt. I., p. 136; Veitch Manual Orch. pt. V. (1889), p. 52.

Leaf 4 or 5 inches long, oblong-lanceolate, narrowing below into a slender pale green petiole sheathed at the base, bright shining green, the back dull green and covered with very minute blackish dots, apex tridenticulate.

Peduncle 8 or 9 inches long, terete, slender, ascending from within a sheath at the base of the petiole, green, spotted with dark crimson, flowers six or eight, all directed to one side; bracts small, membranous, sheathing the pedicels, brownish.

Ovary $\frac{1}{8}$ inch long, grooved, with crenate wings, green.

Sepals all cohering for about $\frac{1}{4}$ inch, forming a very narrow tube, slightly gibbous below, free portion very short, triangular, 3-nerved, tapering into flattened yellow tails about $\frac{1}{2}$ inch long, white, with a blackish-purple stain at the base, and very minute blackish-purple dots upon the outer surface, especially along the central nerves, and upon the outer side of the tails.

Petals $\frac{1}{8}$ inch long, linear at the base, obcordate, apiculate, the margins serrate, with a fleshy angled keel on the anterior margin, white, the keel dark crimson.

Lip about $\frac{1}{8}$ inch long, grooved at the base and united to the curved foot of the column by a flexible hinge, lateral lobes oblong, white edged with crimson, central lobe narrower, with two obtuse longitudinal keels, apiculate, yellow.

Column a little shorter than the petals, green, marked and narrowly winged with dark crimson, apex crenate, foot very dark crimson.

MASDEVALLIA MELANOPUS was one of three species discovered by Roezl in the Andes of North Peru, and named by Professor Reichenbach in 1874 from dried specimens. Much confusion exists as to the identity of Reichenbach's original *M. melanopus*, and many forms and varieties of *M. abbreviata* are cultivated under this name. The plant here represented was sent to me from Glasnevin by Mr. F. W. Moore, and I at once recognised it as agreeing more nearly than any that I had previously seen, with the original description of *M. melanopus* published by Professor Reichenbach, who says (Gard. Chron. 1874, pt. II., p. 322):—"The flowers would appear to be whitish, and all directed to one side. The ovary, the base of the perigone, and the three bristles are very dark, perhaps greenish black or brownish black; when the flowers are dried these parts look black. There are also some small dots of the same colour over the perigone, but they are only well seen with a lens."

Explanation of Plate, drawn from a plant at the Royal Botanic Gardens, Glasnevin, Dublin:

Fig. 1, petals, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip, front view;—3a, lip, side view;—4, column;—4a, apex of column; *all enlarged;*—5, apex and section of leaf, *natural size.*

The most noticeable characteristic of this plant is, perhaps, that, as stated by Professor Reichenbach, the flowers are "all directed to one side." In dried specimens the small spots are less visible, while the dark colour at the base of the flowers becomes more apparent, producing the blackish stain which suggested the name *melanopus*, or "black-foot."

I am indebted to Mr. Moore for numerous examples of these flowers, as well as for a piece of his plant, at that time probably the only one of the species in the British Isles.

Note by Consul Lehmann :

The habitat of *Masdevallia melanopus* is in Ecuador and North Peru, where it grows on trees in dense woods at an elevation of 2,400 to 2,700 mètres (7,800 to 8,775 feet). I have found it on the Cordillera de Amboca, near the villages of Cisne and Chuquiribamba, in the Province of Loja, Ecuador. Also near Cariamanga, Hutiana and Sosoranga, in the mountains of Loja, and of Piura in Peru. It flowers in October and November.

The climate of this region is damp and foggy during the greater part of the year. During the dry season, which lasts only from the end of July to the first few days of October, parching winds sweep over the mountains, and for several hours of the day the sun shines from a cloudless sky, causing many of the plants to shrivel and die off. The annual mean temperature ranges between 14° and 16° Centigrade (about 57° to 61° Fahrenheit).

1a

2.

3

3a

4

4a

Florence H Woolward del et lith 1894.

Goater, imp.

MASDEVALLIA PACHYURA *Rchb. f.*

MASDEVALLIA PACHYURA Rchb. f.

MASDEVALLIA PACHYURA Rchb. f. Gard. Chron. 1874, pt. II., p. 322; 1881, pt. II., p. 336; Linnæa XLI. (1877), p. 12.

Leaf 5 or 6 inches long and nearly 1 inch wide, oval-oblong, narrowing below into a slender grooved petiole sheathed at the base, apex tridenticulate, bright green, petiole dull purple.

Peduncle about 6 inches long, terete, slender, ascending from the base of the petiole, with three or four flowers at intervals of about half-an-inch, pale green, with very minute crimson spots on the upper half, and two sheathing bracts below; flowering bracts minute, apiculate, membranous, pale brownish-green.

Ovary $\frac{1}{8}$ inch long, triangular, with six crenate wings, dull green spotted with dark crimson.

Sepals: dorsal sepal united to the lateral sepals for about $\frac{3}{16}$ inch, forming a wide tube, gibbous below, 3-nerved, ovate, cucullate, margins slightly toothed, pale whitish yellow, semi-transparent, covered with small transverse reddish-crimson spots, the central nerve carinate, green, terminating in a slender yellow tail nearly $\frac{1}{2}$ inch long; lateral sepals cohering for about $\frac{1}{8}$ inch, oblong, 3-nerved, margins reflexed, free portion about $\frac{1}{4}$ inch long, yellow, with reddish-crimson spots and a dark crimson central streak, base dark crimson, central nerves strongly carinate on the outer surface, tapering into orange-yellow tails about $\frac{3}{8}$ inch long.

Petals about $\frac{1}{4}$ inch long, obcordate, acuminate, the margins strongly serrate, with two lateral keels, pale yellow.

Lip a little longer than the petals, united to the foot of the column by a flexible hinge, pandurate, with two lateral lobes terminating in short keels, apex rounded, pale yellow covered with minute red spots.

Column equalling the petals, winged, apex minutely denticulate, greenish-yellow with crimson wings and apex, and a few minute crimson spots on the inner surface.

MASDEVALLIA PACHYURA was discovered by Roezl in the Mountains of Ecuador, and was first described by Reichenbach in 1874 from dried specimens. The plant represented in the accompanying Plate was recently imported by Consul Lehmann for Mr. James O'Brien, to whose kindness I am indebted for the opportunity of drawing the first flowers of this species ever seen in cultivation.

Consul Lehmann sends me the following note:

M. pachyura has a comparatively small distribution along the western slopes of the Western Andes of Ecuador, from the Mountains of Zaruma in 3° 30′ S. lat., to the western slopes of Chimborazo in 1° S. lat., at an elevation of 1,700 to 2,300 mètres (5,525 to 7,475 feet). It is abundant in one small district only, viz., around Cayandelet on the road from Puente de Chimbo to Sibambe, and above Pallatanga on the road from Puente de Chimbo to Cajabamba. In all other localities it is very rare. It usually grows on trees in very damp thick woods, but occasionally I have found it growing upon walls of rock, as at Gualashay on the road to Guaranda. It flowers in March and April, and sometimes also in November. The mean temperature of its habitat ranges from 15° to 18° Centigrade (59° to 64°.4 Fahrenheit).

The plants of *M. pachyura* which I sent to Mr. O'Brien under the name of *M. tridens* I had never seen in flower, and only guessed them to be the latter. Many species of this section (*Amandæ* Rchb. f.) grow mixed together—for instance, *M. Lehmanni*, *M. melanopus*, *M. anachæte*, *M. abbreviata*, *M. pachyura* and *M. tridens*—and as the leaves of all are very much alike, it is a difficult matter to distinguish one from another when out of flower.

Explanation of Plate, drawn from Mr. O'Brien's plant:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, side of lip;—4, column;—4a, apex of column; *all enlarged.*

MASDEVALLIA POLYSTICTA Rchb. f.

MASDEVALLIA POLYSTICTA Rchb. f. Gard. Chron. 1874, pt. I., p. 338 *(nomen nudum)* ; pt. II., p. 290 ; 1875, pt. I., pp. 40 and 656, fig. 134 ; 1881, pt. II., p. 336 ; 1882, pt. I., p. 179 ; 1884, pt. I., p. 741, *in group* fig. 141 ; 1889, pt. I., p. 139 ; Illust. Hort. XXII. (1875), p. 41, pl. CXCIX. ; Bot. Mag. t. 6368 (1878) ; Gartenflora (Regel) vol. XXV. (1876), p. 164, t. 869 ; Revue Hort. 1880, p. 250 ; Orchidophile (Godefroy) vol. I. (1881), p. 271, *var. crassicaudata ;* 1888, p. 283 ; Veitch Manual Orch. pt. V. (1889), p. 58.

Leaf about 5 inches long, and 1 inch wide, oblong-lanceolate, apex tridenticulate, often much recurved, margins reflexed, narrowing below into a grooved petiole, sheathed at the base, bright green.

Peduncle 8 or 10 inches long, many-flowered, terete, ascending from a joint at the base of the petiole, dull green, with minute reddish spots ; pedicels scarcely $\frac{1}{8}$ inch long, terete, curved ; bracts $\frac{1}{4}$ inch long, membranous, ovate, apiculate, concealing the pedicels and the base of the ovary, pale green.

Ovary $\frac{1}{8}$ inch long, with six crenate wings, pale green.

Sepals : dorsal sepal united to the lateral sepals for about $\frac{1}{8}$ inch, forming a wide tube, gibbous beneath, free portion ovate for $\frac{3}{8}$ inch, 3-nerved, cucullate ; lateral sepals cohering for about $\frac{3}{8}$ inch, linear-lanceolate, 3-nerved, margins reflexed ; all white, with numerous small crimson or brownish-red spots, the inner surface closely set with translucent white hairs, the lateral sepals having a broad central streak of orange-yellow ; all terminating in slender tails about $\frac{3}{4}$ inch long, often angled and thickened towards the apex, orange-yellow, greenish at the back, with a few small crimson spots.

Petals about $\frac{1}{8}$ inch long, spathulate, margins ciliate, with a strong keel near the anterior margin, apex acute, white, with a few crimson spots along the keel.

Lip about $\frac{1}{8}$ inch long, pandurate, with two lateral lobes terminating in longitudinal keels near the apex, rich orange-yellow covered with minute crimson spots, apex reflexed, with a rounded central lobe.

Column about $\frac{1}{8}$ inch long, narrowly winged, apex denticulate, pale green, winged with crimson, and with a few crimson spots.

MASDEVALLIA POLYSTICTA was discovered by Roezl in 1874 in the Northern Andes of Peru, where it is found in great abundance, growing with *M. melanopus* and *M. caloptera.* No detailed account of its habitat has been given.

It is apparently an extremely variable species, scarcely two plants bearing exactly similar flowers. The spots upon the sepals vary greatly in number and size, and in depth of colour, being pinkish-purple in some specimens and in others chocolate-crimson. Some plants have thick, stiff flower-stems, and others very slender stems, while the leaves of some are straight and upright, and of others much recurved. The most distinctive characteristics of the species—in whatever form or variety—are the ample membranous bracts and the numerous white hairs within the sepals.

Explanation of Plate, drawn from a Plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, front of lip ;—3a, side-view of lip ;—4, column ;—4a, apex of column ;—*all enlarged ;*—5, apex and section of leaf, *natural size ;*—6, dark variety.

A dark variety, fig. 6 of the accompanying Plate, was sent to me in February by Sir Trevor Lawrence, who informs me that it was found growing in the same mass with the ordinary variety. The spots are rich crimson-purple, suffused and very numerous, nearly covering some of the sepals, and the orange streak seen in the lateral sepals of the ordinary variety, is replaced in this specimen by crimson-purple lines. I have also received this dark variety from Mr. F. W. Moore, Glasnevin, Dublin.

Consul Lehmann sends more detailed information than any hitherto published about the habitat of this species :

Masdevallia polysticta is found in Southern Ecuador and Northern Peru. It grows on trees—generally on *Weinmannias*—or occasionally on rocks, in park-like woods on the Cordillera de Amboca, and in the vicinity of Gonzanamá, Cariamanga and Hutiana in the Province of Loja ; and also around Huancabamba in the Province of Piura, at an elevation of 2,000 to 2,500 mètres (6,500 to 8,125 feet). In general it occurs in great abundance, often covering the trunks and branches of trees, the plants attaining a large size. In the Province of Loja it flowers from November until May.

In these regions there is a long rainy season, lasting from October to July, and during these months the atmosphere is nearly always saturated with moisture. The annual mean temperature ranges between 14° and 16° Centigrade (about 57° to 61° Fahrenheit).

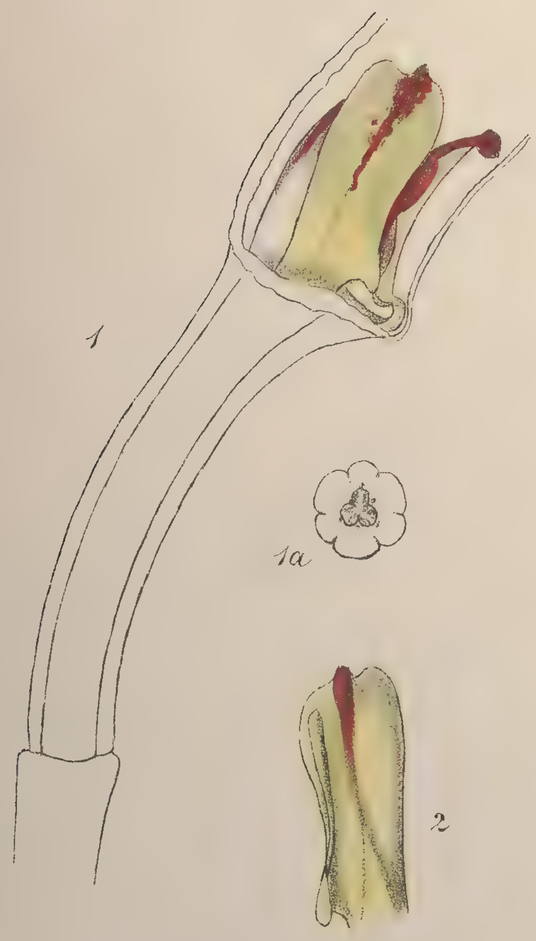
SECTION II.

COCCINEÆ Rchb. f.

THE plants included in this Section are chiefly remarkable for the brilliant colouring of the flowers, the shortness of the lateral tails, and for long slender stems bearing solitary flowers high above the leaves. The petals of all are very much alike in shape, and have beneath the marginal angle a curious mass of white viscid matter, the use of which is not known. All the species hitherto discovered are in cultivation, and are highly prized for the sake of their splendid and variable colouring.

6 species figured :

Masdevallia amabilis Rchb. f.
Barlæana Rchb. f.
coccinea Lind. (=*M. Lindeni, André, et M. Haryana Rchb. f.*)
Davisii Rchb. f.
militaris Rchb. f. (=*M. ignea Rchb. f.*)
Veitchiana Rchb. f.



Florence H.Woolward del.et lith. &c.

MASDEVALLIA AMABILIS *Rchb. f.*

M.&N. Hanhart imp.

MASDEVALLIA AMABILIS Rchb. f.

Masdevallia Amabilis Rchb. f. Bonplandia II. (1854), p. 116 ; Walp. Ann. VI. (1861), p. 193 ; Belg. Hort. 1873, p. 354 ; Illustr. Hort. vol. xxi. (1874), t. 196 (var. lineata) ; Gard. Chron. 1881, pt. II., p. 236.

Leaf 5 to 7 inches long, $\frac{1}{2}$ to 1 inch wide, oblong-lanceolate, tridenticulate, carinate, dark green, narrowing into a slender grooved petiole, sheathed at the base.

Peduncle 10 or 12 inches long, terete, slender, ascending, 1-flowered, pale green tinged with pink, with three or four sheathing bracts, the flowering bract about $\frac{5}{8}$ inch long, 5-nerved, apiculate, pale green or brownish.

Ovary about $\frac{1}{2}$ inch long, curved, with three broad and three narrow rounded angles, pale green tinged with rose-pink.

Sepals : dorsal sepal united to the lateral sepals for nearly one inch, forming a deep narrow tube, slightly curved, yellow shaded and nerved with rose-crimson ; free portion of the dorsal sepal about $\frac{3}{8}$ inch in length, and the same in width, ovate, 3-nerved, orange shaded with crimson, tapering into a very slender tail about $1\frac{1}{2}$ inch long, orange-red and crimson ; lateral sepals cohering for about $1\frac{1}{2}$ inch, $\frac{5}{8}$ inch wide, ovate-triangular, with 3 crimson nerves, brilliant red shaded with rosy crimson, velvety with lustrous microscopic hairs, tails $\frac{3}{4}$ inch long, very slender, dark crimson.

Petals $\frac{1}{4}$ inch long, linear-oblong, curved, apiculate, with a prominent keel on the inner surface parallel to the anterior margin, terminating in a curved point, beneath which is a mass of colourless viscid matter ; pale orange-yellow, apex crimson.

Lip $\frac{1}{4}$ inch long, pandurate, with two longitudinal keels, margin reflexed, apex recurved, pale orange-yellow at the base, then rose-crimson, apex and keels dark crimson.

Column $\frac{1}{4}$ inch long, apex minutely denticulate, very pale yellow, marked at the back and narrowly winged with crimson.

MASDEVALLIA AMABILIS was discovered by Warscewicz in the Peruvian Andes about the year 1850, and was described by Professor Reichenbach in 1854 from dried specimens. It was not known in cultivation until 1872, when Roezl brought living plants from the same region, and these flowered first in 1875, at Brussels, in the collection of Mons. Linden. The flowers, which are faintly sweet-scented, vary much in colour, some being brilliant scarlet veined and shaded with crimson, and others uniform glowing amethyst-crimson with the veins scarcely visible. A less beautiful variety is yellowish, shaded and strongly veined with crimson or red, and it is this form which is figured in L'Illustration Horticole for 1874 as *M. amabilis* var. *lineata*, sometimes also sold as *M. amabilis* var. *striata*.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, lip, column, and petal, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf ; *natural size*.

Florence H. Woolward del. et lith. 1894.

Goater, imp.

MASDEVALLIA BARLÆANA *Rchb. f.*

MASDEVALLIA BARLÆANA Rchb. f.

MASDEVALLIA BARLÆANA Rchb. f. Gard. Chron. 1876, pt. I., p. 170; 1881, pt. II., p. 236; Belg. Hort. 1877, p. 141; Veitch Manual Orch. pt. V. (1889), p. 25.

Leaf about 5 inches long, ovate-lanceolate, apex tridenticulate, bright green, narrowing below into a slender grooved pale green petiole, sheathed at the base.

Peduncle, including the pedicel, 8 or 9 inches long, terete, erect, slender, one-flowered, with two or three sheathing bracts, pinkish; flowering bract nearly $\frac{3}{4}$ inch long, apiculate, sheathing below, dull greenish-pink.

Ovary about $\frac{1}{2}$ inch long, slender, with three large and three small rounded angles, dull pink.

Sepals: dorsal sepal united to the lateral sepals for $\frac{3}{4}$ inch, forming a narrow tube, free portion ovate-triangular for about $\frac{1}{4}$ inch, 3-nerved, terminating in a slender terete tail nearly $1\frac{1}{2}$ inch long; lateral sepals cohering for more than 1 inch, roundly triangular, 3-nerved, terminating in slender tails about $\frac{1}{2}$ inch long; all rose-magenta, shaded and veined with scarlet or crimson.

Petals very minute, oblong, tridentate, with an angled keel on the anterior margin, white.

Lip scarcely as long as the petals, oblong, united to the foot of the column by a flexible hinge, with two longitudinal keels, white, apex slightly reflexed, rose-pink.

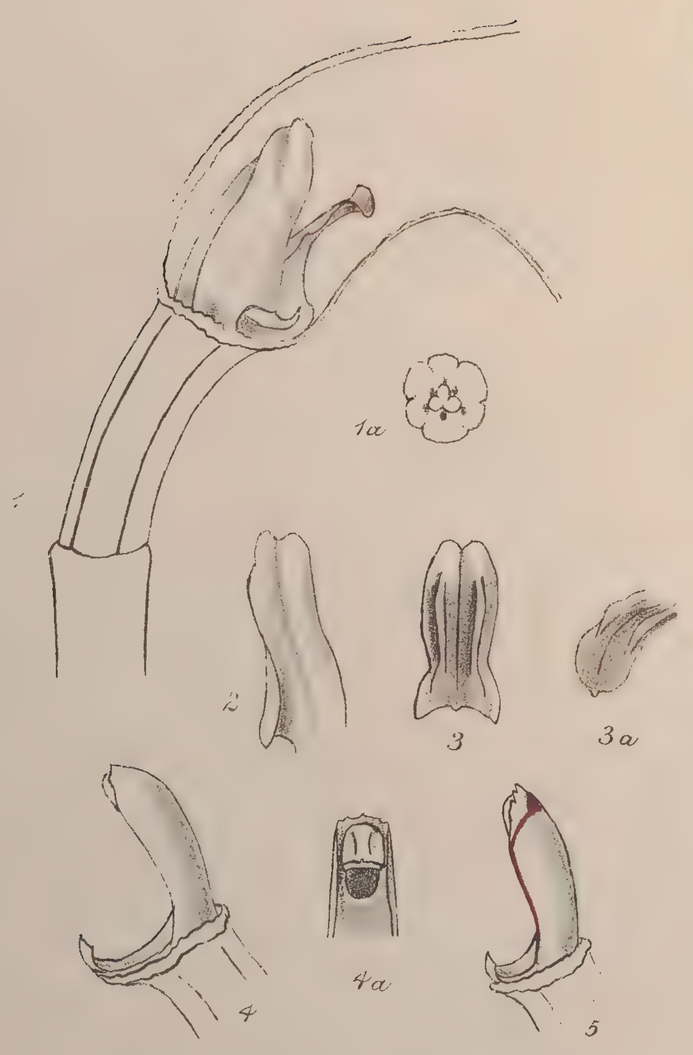
Column shorter than the petals, foot much curved, apex denticulate, white, faintly tinged with pink.

MASDEVALLIA BARLÆANA was discovered near Cuzco, in the Andes of Peru, by Davis, while collecting for Messrs. Veitch, in 1875. It was named by Professor Reichenbach after Senhor Barla, Brazilian Consul, and Director of the Natural History Museum at Nice, and the author of several botanical works.

This species is very closely allied to *M. amabilis*, but a glance at the Plate representing that plant will show that considerable differences exist between the two plants.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged;*—5, apex and section of leaf, *natural size*.



Florence H. Woolward del et lith. 1892.

MASDEVALLIA COCCINEA *Lindl.*

M&N. Hanhart imp

MASDEVALLIA COCCINEA Lind.

MASDEVALLIA COCCINEA Lind. Mss. ; Lindl. Orch. Lind. (1846), p. 5 ; Rchb. f. Bonplandia II. (1854), pp. 115 and 283 ; Xen. Orch. I. (1858), p. 197, t. 74 ; Walp. Ann. VI. (1861), p. 192 ; Gard. Chron. 1868, p. 75, with fig. ; 1880, pt. I., p. 490 ; 1881, pt. II., p. 236, fig 49 ; 1884, pt. I., p. 736, fig. 138 ; 1889, pt. II., p. 239 ; Belg. Hort. 1873, p. 356 ; Garden 1878, pt. I., p. 102 ; Floral Mag. 1880, pl. 410, no. 2 ; Veitch Manual Orch. pt. V. (1889), p. 33.

M. Lindeni André, Illustr. Hort. XVII. (1870), p. 226, pl. XLII. ; XXI. (1874), p. 101 ; Bot. Mag. t. 5990 (1872) ; Floral Mag. 1872, pl. 28 ; 1880, pl. 410, no. 1 ; Florist and Pomol. 1873, p. 169, with col. fig. ; Belg. Hort. 1873, p. 358 ; Gard. Chron. 1874, pt. I., p. 385, fig. 85 ; 1881, pt. II., p. 336, fig. 62 ; 1884, pt. I., pp. 736 and 741 ; Orchids, Jennings, pl. XVII. (1875) ; Garden 1876, pt. II., p. 240 ; 1878, pt. I., p. 102 ; Orchidophile (Godefroy) vol. I. (1881), p. 407 ; Lindenia I. (1885), p. 73, pl. XXXIV. ; *var. grandiflora.*

M. Lindeni var. Harryana André Illustr. Hort. XX. (1873), p. 167, pl. CXLII.

M. Harryana Rchb. f. Gard. Chron. 1871, p. 1421 ; 1879, pt. I., p. 716, *var. læta* Rchb. f. ; 1881, pt. II., p. 305 ; 1884, pt. I., pp. 114 and 741, *in group* fig. 141 ; Florist and Pomol. 1873, p. 169, with col. fig. ; Belg. Hort. 1873, p. 353, pl. XXI. ; Flores des Serres XXI. (1875), p. 155, t. 2250 ; Garden 1878, pt. I., p. 102 ; Floral Mag. 1880, pl. 410, no. 3 ; Orch. Album (Warn. et Will.) I. (1882), pl. 24, *var. cærulescens ;* III. (1884), pl. 105, *var. atrosanguinea ;* pl. 110, *var. miniata ;* V. (1886), pl. 224, *var. Armeniaca* ; VIII. (1889), pl. 344, *var. decora* ; Reichenbachia ser. 2, vol. I. t. 26 (1891), *var. splendens.*

Leaf 8 or 9 inches long, oblong-lanceolate, apex tridenticulate, dark green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle 12 or 15 inches long, terete, slender, ascending from a joint near the base of the petiole, with two or three sheathing bracts, dull green, tinged with crimson or red-brown ; flowering bract nearly 1 inch long, oblong-ovate, sheathing below, carinate, apiculate, dull pale green, with a minute rudimentary bud within at the base.

Ovary $\frac{3}{8}$ inch long, curved, with six rounded angles, shining, brownish-green.

Sepals : dorsal sepal united to the lateral sepals for about $\frac{3}{4}$ inch, forming a curved narrow tube, white at the base, free portion triangular-ovate for $\frac{3}{8}$ inch, 3-nerved, narrowing into a slender recurved tail, $1\frac{3}{4}$ or 2 inches long, pale mauve, tail darker, crimson towards the apex ; lateral sepals cohering for about 1 inch, free portions oblong-ovate for $1\frac{1}{2}$ inch, 5-nerved, terminating in short blunt tails, brilliant magenta-mauve, with rosy crimson nerves, tails darker.

Petals $\frac{5}{8}$ inch long, linear-oblong, keeled and angled on the anterior margin, pure white, faintly nerved with rose.

Lip $\frac{5}{8}$ inch long, oblong-pandurate, with two longitudinal keels, thickened and grooved at the base, margin recurved, white, tinged with rose-pink, apex sharply recurved, rose-crimson, sometimes tinged with yellow.

Column about $\frac{1}{4}$ inch long, very narrowly winged, apex minutely denticulate, white, sometimes winged and tipped with rose-crimson.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, apex of lip ;—4, column ;—4a, apex of column ;—5, column from another specimen ; *all enlarged ;*—6, apex and section of leaf ;—7, *var. Harryana ; natural size.*

MASDEVALLIA COCCINEA was discovered about the year 1842 by Linden, flowering in April on the southern slopes of the mountains near Pamplona, in the Province of Santander, Colombia, at an elevation of 9,500 feet. In this region the mean temperature is 52° Fahrenheit. The first living plant imported into Europe was a small piece sent to Ghent in 1867 by Gustav Wallis, among a quantity of other Orchids from Colombia. This little unknown plant was treated with great care, and when it flowered in 1870, it was named *Masdevallia Lindeni*, and described as a new species by Mons. André in the "Illustration Horticole." From time to time varieties of *M. coccinea* were imported from different elevations and localities in the Eastern Cordilleras of Colombia, until it became universally known and cultivated as the most brilliant and variable species of the genus. In 1871 the first of these varieties, sent to Mr. Harry Veitch from Sogamosa by the collector Chesterton, received the specific name of *Harryana* from Professor Reichenbach, although, from the fact that he published no Latin description of the flower, he does not appear to have really considered it a distinct species.

Some idea of the immense abundance and variability of *M. coccinea* is afforded by the account published in Mr. Veitch's "Manual of Orchidaceous Plants," from which I have permission to make extracts:—Its principal locality is on the eastern Cordillera, between Sogamosa and Concepcion, where its vertical range is 7,000—10,000 feet; it is particularly abundant on that part of the Cordillera called the Sierra Nevada de Chita, where it spreads in uninterrupted masses for miles, covering acres upon acres of the upland slopes, and growing in the partial shade afforded by low shrubs. When in bloom these masses of plants present a most striking sight, not only by the dazzling brilliancy of the colours of their flowers, but also by their astonishing variety. There is scarcely a shade of colour, from deep rich crimson-purple, through magenta-crimson, crimson-scarlet, scarlet, orange, yellow, to cream-white, that is not represented in greater or less abundance, the lighter shades of yellow being the rarest. In the lower limits of its range the leaves are longer, narrower, and darker in colour, and the flowers are less numerous, somewhat smaller, and of uniform colour, merging into that of the form known in cultivation as *M. Lindeni*. It is only at and near the upper limits of its range that the pale yellow and the white varieties occur.

Near Bogotá also, this variable plant has been found, growing in patches several acres in extent, in a climate of frequent rain and dense fogs, at an elevation of 8,000 to 12,000 feet. From this locality pure white flowers have been sent. I am informed by Consul Lehmann, that the local native name for *M. coccinea* is "La Banderita," or "the little flag." One of the dark crimson varieties has also received a name in the native vernacular, signifying "bull's blood," a name now in use in horticultural parlance to distinguish one of the handsomest forms of the plant. Horticultural names have been conferred upon so many sub-varieties that it would be impossible to enumerate them all. Among the most striking forms may be mentioned *atrosanguinea*, with deep crimson-purple flowers; *cærulescens*, magenta-crimson tinged with mauve; *decora*, dazzling magenta; *miniata*, vermilion-red with crimson veins; and *lœta*, rosy-purple. So far as I can ascertain, the pale yellow and the white varieties have never been in cultivation.

The accompanying Plate may be taken to represent, as nearly as can now be determined, the original form of *M. coccinea* collected by Linden.

MASDEVALLIA COCCINEA *var.* HARRYANA.

1

1a

2

5

3

3a

4

4a

Florence H. Woolward. del. et lith. 1891.

M&N. Hanhart imp

MASDEVALLIA DAVISII *Rchb. f.*

MASDEVALLIA DAVISII Rchb. f.

Masdevallia Davisii Rchb. f. Gard. Chron. 1874, pt. II., p. 710 ; 1876, pt. I. p. 366 ; 1881, pt. II., p. 236 ; Bot. Mag. t. 6190 (1875); Gartenflora (Regel) XXV. (1876), p. 57 ; XXVII. (1878), p. 207 and 208 ; Xen. Orch. III. (1878), p. 3, pl. 203 ; Orch. Album (Warn. et Will.) II. (1883), pl. 76 ; Veitch Manual Orch. pt. V. (1889), p. 38.

Leaf 6 or 7 inches long, and about $\frac{1}{2}$ or $\frac{3}{8}$ inch wide, oblong-lanceolate, apex sharply tridenticulate, narrowing below into a slender grooved petiole, sheathed at the base, bright green.

Peduncle, with pedicel, 9 or 10 inches long, terete, slender, ascending from a joint near the base of the petiole, with two or three sheathing bracts, pale green, with small crimson streaks ; flowering bract 1 inch long, oblong-ovate, apiculate, carinate, sheathing below, pale green.

Ovary about $\frac{3}{8}$ inch long, curved, with six rounded angles, bright green.

Sepals : dorsal sepal united to the lateral sepals for about $\frac{1}{2}$ inch, forming a narrow tube, ovate-triangular for about $\frac{5}{8}$ inch, 3-nerved, terminating in a slender tail nearly 1 inch long ; lateral sepals cohering for $1\frac{1}{2}$ or $1\frac{3}{4}$ inch, oblong-ovate, 3-nerved, terminating in slender tails nearly $\frac{1}{4}$ inch long ; all brilliant yellow.

Petals $\frac{3}{8}$ inch long, oblong, apiculate, anterior margin strongly keeled and angled, very pale yellow, the inner surface viscid beneath the keel.

Lip about $\frac{1}{4}$ inch long, oblong-pandurate, with two obscure longitudinal keels, grooved and fleshy at the base, united to the curved foot of the column by a very flexible hinge, yellow, shaded and spotted with red, apex crimson, much reflexed, with a central velvety crimson cushion.

Column $\frac{1}{4}$ inch long, white, yellow at the foot, narrowly winged with crimson, apex minutely crenate, pale yellow.

DISCOVERED in 1873 in the Eastern Cordillera of Peru, not far from Cuzco, by Davis, a collector for Mr. Veitch, whose account of its habitat given in his "Manual of Orchidaceous Plants," I quote as follows : "It occurs on the slopes of the mountains at an immense elevation, probably not less than 10,500—12,000 feet, growing in loam and moss, and also in decaying vegetable matter collected in the crevices of the rocks. Its geographical range appears to be very restricted, extending but a few miles along the flanks of the mountains within the vertical limits stated above, but where, however, plants were seen in all stages of growth, from the smallest seedlings to masses of considerable size."

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, apex of lip ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size*.

Florence H.Woolward del.et lith. 1892.

MASDEVALLIA MILITARIS *Rchb. f.*

M&N. Hanhart imp:

MASDEVALLIA MILITARIS Rchb. f.

Masdevallia militaris Rchb. f. Bonplandia II. (1854), pp. 115 and 283; Walp. Ann. VI. (1861), p. 193; Gard. Chron. 1880, pt. I., p. 742; 1881, pt. II., p. 336; Veitch Manual Orch. pt. V. (1889), p. 52.

M. ignea Rchb. f. Gard. Chron. 1871, p. 1482; 1872, p. 545, fig. 149; p. 571, *var. Marshalliana* Rchb. f.; 1873, p. 1079; 1881, pt. I., p. 136, *var. Stobartiana* Rchb. f.; pt. II., p. 305, fig. 57 *(as in 1872)*; 1884, pt. I., p. 741, *in group* fig. 141; Bot. Mag. t. 5962 (1872); Floral Mag. 1872, pl. 15; Florist and Pomol. 1873, p. 169, with col. fig.; Gartenflora (Regel) vol. XXV. (1876), p. 193, pl. 870 *(as M. coccinea Lind.)*; Garden 1878, pt. I., p. 102, pl. CXIII.; 1885, pt. II., p. 289, with fig.; Illustr. Hort. vol. XXVI. (1879), p. 8, t. 333; p. 136, t. 357, *var. Boddaerti hort. Lind.*; Orchid Album vol. II. (1883), pl. 62; vol. VI. (1887), pl. 273, *var. Massangeana Will.*; Orchidophile (Godefroy) vol. I. (1881-3), p. 196, with fig.; p. 834; vol. V. (1885), p. 367, with fig.; Lindenia vol. V. (1889), pl. CCXIX., p. 57; Veitch Manual Orch. pt. V. (1889), p. 46.

Leaf (with petiole) 8 or 9 inches long, oblong-lanceolate, coriaceous, slightly carinate, apex trident-iculate, dark green, narrowing below into a grooved petiole, sheathed at the base.

Peduncle 12 to 15 inches long, with two or three sheathing bracts, terete, ascending from within the sheath at the base of the petiole, bright green streaked with crimson; flowering bract about 1 inch long, sheathing below, ovate-apiculate above, yellowish-green.

Ovary about $\frac{3}{8}$ inch long, with six rounded angles, green spotted with crimson.

Sepals: dorsal sepal united to the lateral sepals for nearly 1 inch, forming a narrow curved tube, free portion triangular for $\frac{3}{8}$ inch, 3-nerved, tapering into a slender deflexed tail $1\frac{1}{4}$ or $1\frac{1}{2}$ inch long; lateral sepals cohering for nearly 1 inch, elliptic-oval, 3-nerved, margin reflexed, terminating in short blunt crimson-scarlet tails; various shades of orange and scarlet, veined and edged with cinnabar-red.

Petals nearly $\frac{1}{4}$ inch long, linear-oblong, curved, apiculate, with a strong keel near the anterior margin prolonged below into a curved angle, beneath which is a mass of viscid matter, tasteless and colourless; white or ivory, with a crimson central line.

Lip about $\frac{1}{4}$ inch long, fleshy and grooved at the base and united to the curved foot of the column by a flexible hinge, linear-oblong, white and yellow, grooved in the centre, with two short longitudinal crimson keels, margins crenate and more or less reflexed, apex recurved, cordate, apiculate, yellow.

Column $\frac{1}{4}$ or $\frac{3}{8}$ inch long, white, narrowly winged with crimson, apex more or less denticulate.

A VERY variable species, of which the earliest known form was discovered by Warscewicz in January 1849, near Ocaña in the mountains of Santander, Colombia, at an elevation of 9,000 to 10,000 feet, and was named *Masdevallia militaris* by Professor Reichenbach. Out of a large consignment of plants sent to Europe by

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Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, apex of lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

Warscewicz only a small number survived the voyage, and specimens of these are still cultivated in a few collections under the name of *M. militaris.* No further importation of this plant was made until 1870, when Mr. Day, of Tottenham, introduced from the same locality a variety to which Professor Reichenbach gave the name of *M. ignea,* the two plants being for a long time considered distinct species. In 1871, when Professor Reichenbach published his first description of the brilliantly coloured *M. ignea,* he was probably not aware of the extreme variability of the species, having previously seen only the paler form collected by Warscewicz twenty years earlier; his descriptions are equally applicable to many of the varieties now well known.

The fullest account of the habitat of *M. militaris* is given by Roezl, who, in 1870, also found the plant in the mountains of Ocaña. It was growing in countless thousands on a slope, at an elevation of 11,000 to 12,000 feet, among low flowering shrubs, such as *Thibaudia* and *Vaccinium, Melastomaceæ* with fruits varying from yellow to dark red or black, *Ageratum* in masses of blue and white, terrestrial species of *Oncidium,* etc., which, mingling with its yellow, orange, and fiery-scarlet flowers, formed a brilliant display of colour. Roezl relates that the brighter kinds of *Masdevallia* are greatly admired by the native Indians, who plant them in open spaces acres in extent, and make use of them on festal occasions for decorating their chapels and huts. Among this abundance of specimens Roezl and a companion remained for several days, collecting the finest plants in immense numbers to send to Europe. His valuable importation was, however, doomed to destruction, for it arrived at the port of St. Nazaire on the Loire during the Franco-German war, and was detained there so long that every plant perished.

The atmosphere at this great elevation in the mountains of Ocaña, although fresh and breezy, is always damp, with thick fogs every morning, and two rainy seasons during the year. Wet moss covers the ground and rises in little mounds over the roots of the plants, preserving constant moisture. The differences of situation and altitude in which *M. militaris* grows cause infinite variation in the size and colour of its flowers, as well as in the habit of the plants, and even in their time of flowering. Plants growing at the lower level, in deeper soil or under the shade of spreading shrubs, develop longer, more slender leaves and stems and less brilliant flowers, while those growing at a greater elevation, in rocky and exposed places, have short stiff leaves and more brightly coloured flowers. These characteristics are often retained by individual plants after a long period of cultivation. Hence the wide range of variation seen in every collection, and the popularity of this species among horticulturists, under whatever name.

A few of the most distinct varieties are : *Massangeana,* with large flowers, yellow and cinnabar-red; *aurantiaca,* light orange-red; *Boddærti,* crimson-scarlet marked with pale yellow ; *citrina,* light orange-yellow ; *Stobartiana,* orange-yellow, tinged and edged with mauve-purple. Plants cultivated under the name of *M. ignea* are of a much brighter scarlet than those called *M. militaris* ; of the latter I have seen flowers said to have come from one of Warscewicz's original plants. The flowers here represented are nearer those named by Professor Reichenbach *M. ignea* than those named by him *M. militaris.*

Several hybrids have been raised between *M. militaris (M. ignea)* and other species:

M. Fraseri Rchb. f. Gard. Chron. 1882, pt. I., p. 143 ; tube orange-red, sepals magenta-crimson tinged with orange ; raised in the collection of Mr. Fraser, of Derncleugh, Aberdeen, between *M. militaris (M. ignea)* and *M. coccinea (M. Lindeni).*

M. Hincksiana Rchb. f., see *M. tovarensis.*

M. Ellisiana Rolfe, Gard. Chron. 1889, pt. II., p. 154 ; tube bright yellow shaded with rose, sepals richly tinted with orange, rose, and crimson ; raised in the collection of Messrs. Veitch at Chelsea, between *M. coccinea var. Harryana* and *M. militaris.*

M. Mundyana, Gard. Chron. 1891, pt. I., p. 682 ; and *M. Heathii,* Gard. Chron. 1891, both raised by Mr. F. Sander, of St. Albans, between *M. militaris var. aurantiaca* and *M. Veitchiana.*

MASDEVALLIA VEITCHIANA *Rchb. f.*

Hanhart imp

MASDEVALLIA VEITCHIANA Rchb. f.

Masdevallia Veitchiana Rchb. f. Gard. Chron. 1868, p. 814, and p. 1338 ; 1871, p. 1421, fig. 310A ; 1879, pt. II., p. 305, fig. 49x, w ; 1881, pt. II., p. 409, fig. A ; 1883, pt. I., p. 662 (var. biflora Rchb. f.) ; Bot. Mag. t. 5739 (1868) ; Illustr. Hort. vol. XV. (1868), p. 107 ; Flore des Serres t. 1803 (1868) ; Floral Mag. vol. IX. (1870), t. 481 ; Belg. Hort. 1873, p. 361 , Florist and Pomol. 1873, p. 169, fig. 1 of coloured Plate ; Warner, Select Orch. ser. 2 (1865–1875), t. 33 ; De Puydt, Les Orch. (1880), p. 289, t. 25 ; Lindenia, vol. II. (1886), p. 97, t. 95.

Leaf 9 or 10 inches long, linear-oblong, obtusely tridenticulate, carinate, dark green, narrowing below into a slender grooved petiole, pale green, sheathed at the base.

Peduncle 12 to 18 inches long, terete, slender, with two or three sheathing bracts, green, with small crimson streaks ; flowering bract about 1 inch long, 5 or 7-nerved, carinate, apiculate, sheathing, pale green.

Ovary $\frac{1}{4}$ to $\frac{1}{2}$ inch long, with six rounded angles, dull green shaded with crimson.

Sepals : dorsal sepal united to the lateral sepals for about $1\frac{1}{4}$ inch, forming a narrow curved tube, free portion triangular-ovate for 1 inch, 3-nerved, tapering into a slender tail 1 or 2 inches long ; lateral sepals cohering for about $1\frac{1}{2}$ inch, free portions oblong-triangular, 5-nerved, margins reflexed, tapering into slender tails $\frac{1}{2}$ or $\frac{3}{4}$ inch long, inner surface of all brilliant orange-scarlet, more or less closely set with short, translucent, purple hairs ; outer surface pale yellow, nerved and shaded with scarlet.

Petals varying slightly in different specimens, nearly $\frac{1}{2}$ inch long, linear-oblong, apiculate or tridenticulate, anterior margin narrowly keeled, terminating in an angle with a mass of viscid, tasteless, colourless matter beneath, white, sometimes tinged with yellow at the apex.

Lip varying in different specimens, about $\frac{1}{2}$ inch long, united to the curved foot of the column by a flexible hinge, fleshy at the base, linear-oblong, margin variably reflexed, white and rose-purple, with two longitudinal, dark purple keels, apex sharply reflexed, very dark purple, with a velvety cushion of minute papillæ.

Column $\frac{1}{4}$ to $\frac{3}{8}$ inch long, apex denticulate, white, narrowly edged with crimson.

MASDEVALLIA VEITCHIANA was discovered near Cuzco, in 1867, by Pearce, at an elevation of 11,000 to 13,000 feet, and was named and described by Professor Reichenbach in 1868. With Mr. H. Veitch's permission I quote from his "Manual of Orchidaceous Plants," Part V. p. 69, the following account by his collector Davis of the habitat of this species :

"*Masdevallia Veitchiana* occurs above the timber line, at the altitude above stated ; the plants are found in the crevices and hollows of the rocks with but little soil about their roots, but sometimes where a small quantity of decaying vegetable matter has accumulated ; in this case the plants are more robust, and when partially shaded by

the stunted shrubs found here and there, or by projecting rocks, produce larger flowers; in the former case the plants are more tufted and more floriferous, but the flowers are smaller. At this great altitude, notwithstanding the tenuity of the atmosphere, the heat from the direct rays of an almost vertical sun is very great on clear days, but the nights are damp and chilly; the range of temperature is therefore very considerable. Vapour is constantly rising from the streams and valleys below, keeping the atmosphere always highly charged with moisture; besides this, rain is frequent, even in what is called the dry season."

Although *M. Veitchiana* rarely produces more than one flower upon the same stem, a plant at Newbattle, from which the accompanying plate was drawn, for several successive years developed stems bearing two flowers, the upper flower expanding some days after the lower, and being always considerably smaller. There were besides, single-flowered stems upon the same plant. Professor Reichenbach, to whom a two-flowered stem from this plant was forwarded, noticed it in the Gardeners' Chronicle, 1883, pt. I., p. 662, as var. *biflora*. Variation in the size and colour of the flower appears to be due only to more or less successful methods of cultivation.

In the first published figure of *M. Veitchiana*, plate 5739 of the Botanical Magazine, drawn by Mr. W. H. Fitch, the plant is represented with a small pseudo-bulb, and several botanical publications, copying or slightly altering their plates from this figure, perpetuated the error. No species of the genus *Masdevallia* has pseudo-bulbs. The grooved leaf-stalk springs from a rigid rounded stem, often more slender than the leaf-stalk itself, and concealed by a sheathing bract-like membrane surrounding the base.

Several hybrids have been artificially raised between *M. Veitchiana* and other species of *Masdevallia*, viz.:

M. Chelsoni Rchb. f. Gard. Chron. 1880, pt. I., p. 554; an artificial hybrid between *M. amabilis* and *M. Veitchiana;* colour, orange-red, more or less closely set with minute crimson hairs.

M. splendens Rolfe, Gard. Chron. 1889, pt. I., p. 619; an artificial hybrid between *M. Veitchiana* and *M. amabilis*, the reversed cross of the above; colour, brilliant orange-crimson, with amethyst hairs.

M. Gairiana Rchb. f. Gard. Chron. 1884, pt. II., p. 38; an artificial hybrid between *M. Veitchiana* and *M. Davisii*; colour, orange-yellow, with crimson hairs.

M. splendida Rchb. f. Gard. Chron. 1878, pt. I., p. 493; colour, orange-scarlet, with purple hairs.

M. Parlatoreana Rchb. f. Gard. Chron. 1879, pt. I., p. 172; colour, brilliant orange-scarlet, with crimson-purple hairs.

The two last-mentioned hybrids are especially interesting as having been found growing wild in the habitat of *M. Veitchiana*. Professor Reichenbach, on examining wild specimens of *M. splendida*, suggested that the plant might be a natural hybrid between *M. Veitchiana* and *M. Barlœana*, or between *M. Veitchiana* and *M. amabilis*. His opinion was afterwards confirmed, a plant exactly identical with the wild specimens of *M. splendida* having been raised by Mr. Seden, in the establishment of Messrs. Veitch, by fertilising flowers of *M. Veitchiana* with pollen from flowers of *M. Barlœana*. *M. Parlatoreana* has been proved to be the result of the reversed cross, and has larger and more brilliantly coloured flowers than *M. splendida*.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petals, lip, and column, in natural position;—1a, section of ovary;—2 and 2a, petals from different specimens, inner side;—3 and 3a, lips from different specimens;—4, column;—4a, apex of column; *all enlarged;*—5, apex and section of small leaf, *natural size*.

SECTION III.

CORIACEÆ Rchb. f.

MOST of the plants in this Section have rigid, leathery (*coriaceous*) leaves, and thick succulent flowers, borne erect upon strong stalks, or pushed out laterally from the base of the leaf-stem. The flowers of nearly all the species have two well-developed nectaries at the base of the lip, containing, in three or four instances, a considerable quantity of honey. In this Section are included the most fragrant and the most malodorous of the Genus.

18 species figured :

Masdevallia campyloglossa Rchb. f.
civilis Rchb. f. (=*M. æquiloba Regel, et M. rufolutea Lindl.*)
coriacea Lindl. (=*M. Bruchmülleri Lind.*)
cupularis Rchb. f.
elephanticeps Rchb. f. (=*M. Gargantua Rchb. f.*)
fractiflexa Lehm. MS. (*not in cultivation.*)
fragrans, sp. nov.
Laucheana Rchb. f.
leontoglossa Rchb. f.
Mooreana Rchb. f. (=*M. elephanticeps var. pachysepala Rchb. f. et M. sororcula Rchb. f.*)
Ortgiesiana hort.
pachyantha Rchb. f.
Peristeria Rchb. f.
platyglossa Rchb. f.
porcelliceps Rchb. f.
striatella Rchb. f.
torta Rchb. f.
velifera Rchb. f.
Yauperyensis Rodrig. (*not in cultivation.*)

Not in cultivation :

M. affinis Lindl. Orch. Lind. (1846), p. 5.
angulata Rchb. f. Otia. Bot. Hamb. (1878), p. 15.
Bonplandii Rchb. Bonplandia III. (*1855*), *p. 69.*
Cayennensis Rchb. f. Otto et Dietr. Allg. Gartenz. XXIII. (1855), p. 243.
chloracra Rchb. f. Flora (Singer) 1886, p. 560.
ellipes Rchb. f. Linnæa XLI. (1877), p. 11.
ensata Rchb. f. Linnæa XXII. (1849), p. 818.
fractiflexa Lehm. *(see Plate).*
heterotepala Rchb. f. Flora (*Singer*) *1886, p. 561.*
lævis Lindl. Ann. Nat. Hist. (*1845*), *p. 257.*
lepida Rchb. f. Bonplandia III. (*1855*), *p. 69.*
macroglossa Rchb. f. Otia. Bot. Hamb. (*1878*), *p. 15.*
pardina Rchb. f. Otia. Bot. Hamb. (*1878*), *p. 15.*
Yauaperyensis *Rodrig.* (*see Plate.*)

Florence H. Woolward del et lith. 1894.

Coater, Imp.

MASDEVALLIA CAMPYLOGLOSSA *Rchb. f.*

MASDEVALLIA CAMPYLOGLOSSA Rchb. f.

MASDEVALLIA CAMPYLOGLOSSA Rchb. f. Gard. Chron. 1878, pt. II., p. 588; Orchidophile (Godefroy) 1881, p. 84; Veitch Manual Orch. pt. V. (1889), p. 27.

Leaf about 4 inches long, oblong-lanceolate, very thick and leathery, stiff and erect, obtusely tridenticulate, dark green, sometimes tinged with dull red, narrowing below into a stout grooved petiole, sheathed at the base.

Peduncle, with the pedicel, about 2 inches long, terete, slender, growing laterally from the base of the petiole, with two or three sheathing bracts, pale green spotted with crimson; flowering bract about $\frac{1}{2}$ inch long, apiculate, sheathing below, with a rudimentary bud within at the base, pale green when young, with crimson spots, fading to pale brownish-yellow.

Ovary a little more than $\frac{1}{4}$ inch long, much curved, with six rounded angles, very dark green, with minute crimson spots.

Sepals: dorsal sepal united to the lateral sepals for $\frac{1}{4}$ inch, forming a wide tube or cup, free portion ovate-triangular for nearly $\frac{3}{8}$ inch, 3-nerved, tapering into a fleshy tail nearly $\frac{1}{2}$ inch long; lateral sepals cohering for about $\frac{3}{8}$ inch, free portion ovate-triangular for nearly $\frac{1}{2}$ inch, 3-nerved, terminating in a fleshy tail $\frac{1}{4}$ inch long; all pale greenish yellow, with numerous crimson spots, chiefly upon the nerves.

Petals nearly $\frac{3}{8}$ inch long, linear at the base, upper part ovate, acuminate, with a sharp angle on the anterior margin, very pale green, with a central line of dull crimson spots.

Lip about $\frac{1}{2}$ inch long, united by a strong hinge to the foot of the column, oblong, curved, crenate at the margin, surface rough, especially towards the apex, whitish-green, with three longitudinal crimson lines, apex green.

Column shorter than the petals, stout, narrowly winged, apex slightly crenate, green, the foot yellow.

THE habitat of this species is unknown, and the only information to be obtained about it is, that it was purchased at a sale of Orchids at Stevens' Rooms, in 1878, by Messrs. Veitch, who distributed specimens among the few collections which possess the plant.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, base of lip *(much enlarged)*;—4, column;—4a, apex of column; *all enlarged*; 5, apex and section of leaf, *natural size*.

Florence H.Woolward. del. et lith. 1890.

M&N. Hanhart imp.

MASDEVALLIA CIVILIS *Rchb. f.*

MASDEVALLIA CIVILIS Rchb. f.

Masdevallia civilis Rchb. f. Bonplandia II. (1854), p. 115 ; Walp. Ann. VI. (1861), p. 191 ; Bot. Mag. t. 5476 (1864) ; Belg. Hort. 1873, p. 356 ; Gard. Chron. 1881, pt. II., p. 236 ; Veitch Manual Orch., pt. V. (1889), p. 33.

M. æquiloba Regel, Gartenfl. IX. (1860), p. 82, t. 285 ; Belg. Hort. 1873, p. 353 ; Gard. Chron. 1881, pt. II., p. 236 ; Orchidophile (Godefroy), 1881, p. 83.

M. rufolutea Lindl. Wrswcz. Cat. 1853 ; Gard. Chron. 1853, pp. 192 and 328.

Leaf 8 or 9 inches long, $\frac{3}{8}$ to $\frac{1}{2}$ inch wide, linear, recurved, very thick and fleshy, apex obtusely tridenticulate, dull green, narrowing below into a very thick, deeply-grooved, pale green petiole, with large membranous sheaths at the base.

Peduncle, including pedicel, about 3 inches long, with two or three sheathing bracts, erect, terete, attenuate towards the base, bright pink below, greenish above, with numerous small crimson spots ; flowering bract $\frac{1}{2}$ inch long, 3-nerved, closely sheathing below, with a rudimentary bud within at the base, pale green or purplish.

Ovary about $\frac{1}{4}$ inch long, with six rounded angles, shining, pale green spotted with crimson.

Sepals : dorsal sepal united to the lateral sepals for about $\frac{3}{4}$ inch, forming a wide tube ; lateral sepals cohering for about 1 inch, gibbous beneath ; all sepals ovate-triangular for nearly $\frac{1}{2}$ inch, 3-nerved, fleshy, greenish-yellow spotted with dark crimson-brown, inner surface rough with minute silver-white hairs, outer surface shining, crimson near the base, nerves dotted with minute brown spots ; each sepal terminating in a slender flattened tail, orange-yellow in front, dark brown or spotted at the back.

Petals about $\frac{1}{2}$ inch long, slightly curved, linear at the base, very thick and fleshy, margins angled and much thickened, white, very shining, with a broad central streak of crimson, base rich crimson, apex acute, greenish.

Lip a little longer than the petals, oblong, fleshy, base deeply grooved in the centre, with a hollow nectary on each side, anterior portion with one central and two lateral keels, all widening and terminating in a rounded warty line, dull greyish-white, with numerous dark crimson spots, apex rough with obtuse papillæ, blackish crimson.

Column $\frac{3}{8}$ inch long, very thick, winged, pale green outside, brilliant crimson within, foot dark rich crimson.

MASDEVALLIA CIVILIS was discovered by Warscewicz upon the eastern slopes of the Peruvian Andes, and was first described by Professor Reichenbach in 1854. A description and an uncoloured Plate are given by Regel in "Gartenflora" of 1860, under the name of *Masdevallia æquiloba*, a plant which he considers to be distinct from *M. civilis*, and which was also collected by Warscewicz in the Andes of Peru. The very

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Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petals, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, base of lip, showing nectaries *(much enlarged)* ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size*.

trifling differences mentioned by Regel, chiefly some small characteristics of the flowering bract, do not, however, justify specific distinction.

A dried specimen in the Lindley collection of *Masdevallia* in the Royal Herbarium, Kew, collected by Warscewicz at the sources of the Marañon (or Amazon) in May, 1853, and named by him *M. rufolutea*, is identical with *M. civilis* of Professor Reichenbach, who, during one of his numerous visits to Kew, wrote underneath this specimen the name *M. civilis*. No botanical description was ever published under the name *rufolutea*, which first appeared in a catalogue of the sale of Warscewicz's plants in 1853.

The thick, rigid, and very narrow leaves are a marked characteristic of *M. civilis*, the flowers of which species, outwardly dull and unattractive, show internally great beauty of structure and colouring. The succulent sepals and petals of this and of many allied species are, in cultivation, often found to be gnawed by small insects. In their native wilds, where the insect necessary to the requirements of each species is probably to be found, it is possible that this dainty food may be the means of attracting suitable insects to aid in the work of fertilization, Honey is rarely present in the small nectaries more or less developed in every species nearly allied to *M. civilis*, but the surface of the sepals and petals, and sometimes of the column, is often intensely shining, or covered with viscid matter—perhaps equally attractive.

Hardly anything is known about the method of fertilization of any species of *Masdevallia*, although in a wild state most of them appear to ripen seeds in abundance. In the Herbarium Boissier at Chambésy, near Geneva, nearly all the specimens of *Masdevallia* (more than 150 in number, most generously placed at our disposal for the furtherance of the present work), show fine capsules in various stages of developement. The large size attained by a ripe capsule in proportion to its size during the flowering stage is very remarkable.

Consul Lehmann gives the locality in which he has found this species:

Masdevallia civilis is found in the vicinity of Huancabamba, in the Department of Piura, North Peru, at an elevation of 2,100 to 2,500 mètres (6,825—8,125 feet). It grows among grasses and small shrubs in loamy soil, and upon rocks where thin layers of vegetable matter and soil have accumulated. The plants are a good deal exposed to the sun, and to the winds which sweep during several months of the year over the high plains of the Andes. Those exposed to the full influence of the sun are much smaller and have darker flowers than those growing partly sheltered and shaded under the shrubs.

The annual temperature of the above region is between 14° and 16° Centigrade (about 57° to 61° Fahrenheit).

F. C. LEHMANN.

Florence H Woolward del et lith 1892

M&N Hanhart imp.

MASDEVALLIA CORIACEA *Lindl.*

MASDEVALLIA CORIACEA Lindl.

MASDEVALLIA CORIACEA Lindl. Ann. Mag. Nat. Hist. XV. (1845), p. 257 ; Orch. Lind. (1846), p. 4 ; Karsten Flora Colomb. (1862-1869) vol. II., p. 103, t, CLIII. ; Gard. Chron. 1872, p. 1067 ; 1881, pt. II., p. 236 ; Belg. Hort. 1873, p. 356 ; Veitch Manual Orch. pt. V. (1889), p. 36.

M. Bruchmülleri Linden Cat. n. 90 (1873) ; Belg. Hort. 1873, p. 355 ; Gard. Chron. 1881, pt. II., p. 236.

Leaf 6 or 8 inches long and about $\frac{5}{8}$ inch wide, linear, slightly carinate, thick and fleshy, apex obtusely tridenticulate, dull green, narrowing into a thick, grooved petiole, sheathed at the base.

Peduncle, including the pedicel, about 7 or 8 inches long, with two bracts, terete, 1-flowered or rarely 2-flowered, ascending from a joint at the base of the petiole, pale green spotted with crimson ; flowering bract about 1 inch long, ovate-acuminate above, sheathing below, 5-nerved, pale green spotted with purple.

Ovary about $\frac{1}{2}$ inch long, with three broad and three narrow rounded angles, shining, bright green, minutely dotted with crimson.

Sepals : dorsal sepal united to the lateral sepals for $\frac{1}{2}$ inch, forming a wide tube, free portion ovate-triangular for $\frac{1}{2}$ inch, 3-nerved, greenish-white, spotted along the nerves with crimson ; lateral sepals cohering for about an inch, free portions ovate-triangular for nearly $\frac{3}{4}$ inch, 3-nerved, greenish-white, covered on the inner surface with minute white hairs, nerves pale green spotted with crimson, the spots very numerous at the base of the tube ; all the sepals terminating in thick fleshy tails $\frac{1}{2}$ to 1 inch long, greenish or dull pale yellow, spotted at the back with crimson, green at the apex.

Petals $\frac{1}{2}$ inch long, oblanceolate, thick and fleshy, with a prominent angle near the centre of the anterior margin, beneath which the inner surface is covered with thick viscid matter, tasteless and colourless ; shining white, central nerve crimson, apex greenish.

Lip about $\frac{1}{2}$ inch long, oblong, with two longitudinal, angled keels, greenish-white, with three crimson lines terminating before the apex ; base fleshy, united to the curved foot of the column by a flexible hinge, deeply grooved, with a wide hollow nectary on each side, purple with minute dots ; apex triangular, greenish, crenate and covered with minute papillæ.

Column about $\frac{1}{2}$ inch long, pale green, narrowly winged with crimson, apex minutely denticulate, foot white or pink, spotted with crimson.

MASDEVALLIA CORIACEA was discovered by Hartweg on the hills of Montserrate near Bogotá, and his dried specimens were described in 1845 by Dr. Lindley. Shortly afterwards it was found by Linden at an elevation of 7,200 feet, growing upon trees in the forests of Fusagasuga in the Province of Bogotá, flowering in December, the temperature at this altitude being about 59° Fahrenheit.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, side of petal ;—3, lip ;—3a, base of lip, showing nectaries *(much enlarged)* ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size* ;—6, seed-capsules from wild plant.

Dr. Karsten, in his "Flora Colombiæ," gives a drawing of the plant from fresh specimens found by him in the mountains of Bogotá, 8—9,000 feet above the level of the sea, where it grows in dense masses upon moss-covered rocks, and on the bark of trees, over which it spreads its fleshy rounded roots.

The species seems to be a variable one, for, in the Plate above mentioned, the flowers are represented as bright yellow, and Dr. Lindley also, in his description both of Hartweg's and Linden's plants, states that the colour of the flowers is yellow. The accompanying Plate represents the ordinary form of *M. coriacea* now in cultivation, and I have never seen a plant of this species with distinctly yellow flowers. A more brightly spotted form of *M. coriacea* is sold by some dealers under the name of *M. Bonplandii*, the spots within the tube of the flower and upon the lip being especially numerous and brilliant.

I am informed by Consul Lehmann that the true *M. Bonplandii* of Reichenbach is a totally distinct species, more nearly allied to *M. civilis* than to *M. coriacea.* Professor Reichenbach in 1855 described it as a distinct species, and in 1872 decided to consider it only a variety of *M. coriacea.*

The first living plants of *M. coriacea* imported into England were those sent in 1871 to Messrs. Hugh Low and Co., of Clapton, by their collector Bruchmüller, in whose honour they named the plant *M. Bruchmülleri*, under the impression that it was an unknown species.

Fig. 6 of the accompanying Plate shows ripe seed-capsules of *M. coriacea*, drawn from dried specimens in the Boissier Herbarium at Chambésy near Geneva, and found in 1883 by Consul Lehmann on the Savana de Bogotá. To the generosity and courtesy of Mons. Eugène Autran, Curator of the Boissier Herbarium, I am indebted for the opportunity of making this interesting addition to my drawing.

Consul Lehmann's note on this species is as follows :

M. coriacea grows on sandstone rocks upon which thin layers of soil and decayed leaves have accumulated, and is found along the western border of the Savana de Bogotá, at an elevation of 2,500 to 2,650 mètres (about 8,125 to 8,612 feet). It is plentiful in the vicinity of Bojacá, Facatativa, Tres Esquinas and Subachoque, and in all these localities it is exposed to severe changes of climate—sun, rain, and strong winds. The annual average temperature of this region is between 13° and 15° Centigrade (about 55° to 59° Fahrenheit).

Florence H. Woolward del et lith. 1895.

MASDEVALLIA CUPULARIS *Rchb. f.*

Goater Imp.

MASDEVALLIA CUPULARIS Rchb. f.

MASDEVALLIA CUPULARIS Rchb. f. Beitr. Orch. Centr. Amer. (1866), p. 93; Gard. Chron. 1879, pt. I., p. 559; Godm. et Salv. Biologia Centr. Amer., Bot. Hemsley, vol. III. (1882-1886), p. 207; Orchidophile 1888, p. 162.

Leaf about 2 inches long, oval, coriaceous, carinate at the back, apex tridenticulate, narrowing below into a slender grooved petiole sheathed at the base, bright green.

Peduncle, with the pedicel, a little longer than the leaves, terete, erect, slender, attenuate below, with two sheathing bracts, pale green; flowering bract about $\frac{1}{4}$ inch long, membranous, acuminate, sheathing below, with a minute rudimentary bud within at the base, brownish-green.

Ovary $\frac{1}{4}$ inch long, curved, with three large and three small rounded angles, bright green.

Sepals all cohering equally for about $\frac{1}{2}$ inch, forming a cup-like tube, gibbous below, free portions triangular-ovate for $\frac{3}{8}$ inch, 3-nerved, the principal nerves carinate without, semi-transparent, reddish-yellow, closely spotted with crimson, the nerves green; terminating in slender flattened greenish tails, tinged with red at the base, rather more than $\frac{1}{2}$ inch long.

Petals $\frac{1}{4}$ inch long, oblong, apiculate, with a rounded angle on the anterior margin and a small keel near the opposite side, dull yellow spotted with red.

Lip nearly twice as long as the petals, lobed and fleshy at the base, and united to the curved foot of the column by a flexible hinge, oblong-cordate, margins reflexed, yellowish, spotted and stained with red, with dark red longitudinal lines, the apex studded with long crimson papillæ, much reflexed.

Column $\frac{3}{8}$ inch long, narrowly winged, apex denticulate, foot much curved, green, tipped with white and edged with crimson.

MASDEVALLIA CUPULARIS was discovered in August, 1857, by Hermann Wendland, at Desengaño, in Costa Rica, and was again found nearly thirty years after, by Hübsch, in the same locality. It is still a rare plant and exists in very few collections, all the specimens in cultivation having probably originated from an importation of Hübsch's plants by Mr. Sander, with whom it first flowered in 1887.

Explanation of Plate, drawn from a plant in the collection of Mr. Sydney Courtauld:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, base of lip *(much enlarged)*;—3b, reflexed apex of lip;—4, column;—4a, apex of column; *all enlarged*; 5, apex and section of leaf, *natural size*.

Florence H Woolward del et lith 1894

Hanhart imp.

MASDEVALLIA ELEPHANTICEPS *Rchb f*

MASDEVALLIA ELEPHANTICEPS Rchb. f.

MASDEVALLIA ELEPHANTICEPS Rchb. f. Bonplandia II. (1854), p. 116 ; III. (1855), p. 69 ; Xen. Orch. I. (1858), p. 6, t. 3 ; Flor. des Serres ser. I., vol. X. (1854-5), p. 77, t. 997 ; Walp. Ann. VI. (1861), p. 192 ; Gard. Chron. 1881, pt. II., p. 236 ; Veitch Manual Orch. pt. V. (1889), p. 40.

M. Gargantua Rchb. f. Gard. Chron. 1876, pt. II., p. 516 ; 1881, pt. II., p. 305 ; 1886, pt. I., p. 13 ; Veitch Manual Orch. pt. V. (1889), p. 43.

Leaf 9 or 10 inches long, oblong, tridenticulate, narrowing below into a thick grooved petiole, sheathed at the base, bright green, with a few crimson spots, the younger ones very bright, the older ones tinged with rich purple.

Peduncle 1½ inch long, pedicel about the same length, terete, with two sheathing bracts, ascending from within the sheath at the base of the petiole, green, with crimson spots ; flowering bract about 1 inch long, ovate, apiculate, sheathing below, brownish-green, with a minute rudimentary bud within at the base.

Ovary nearly ½ inch long, with six rounded angles, bright green, with crimson spots.

Sepals : dorsal sepal united to the lateral sepals for about ¾ inch, forming a wide tube, gibbous below, free portion ovate-triangular for about ¾ inch, 3-nerved, tapering into a flattened fleshy tail about 1¾ inch long, brilliant lemon-yellow, the tail brighter yellow, green at the back ; lateral sepals cohering for 2¾ inches, free portions oblong-ovate, angled at their junction, margins reflexed, 3-nerved, the nerves prominent on the outer surface, depressed within, deep reddish-crimson, rather shining, the surface covered with blunt excrescences, yellow at the margins, tube pale greenish-yellow, deeply stained with crimson within at the base, very thick and substantial.

Petals about ⅝ inch long, thick and fleshy, oblong-ovate, anterior margin with a thick angled excrescence, beneath which the surface is covered with colourless viscid matter, white, shining, with a rich crimson central streak and a few spots.

Lip about ¾ inch long, oblong, fleshy and grooved at the base, and united to the foot of the column by a flexible hinge, with a shallow nectary on each side, margins reflexed, greenish, broadly bordered with crimson, rough with papillæ, the apex dark crimson, with a rounded central line, and covered with coarse branching purple-crimson hairs.

Column about ½ inch long, very thick, broadly winged, green edged with crimson, apex minutely denticulate, margin studded with minute viscid drops.

THE first specimens of this magnificent plant were dried ones sent with a drawing to Professor Reichenbach by its discoverer, Warscewicz, who found it in 1850, in the mountains of Santander, between Ocaña and Pamplona, growing in woods on damp turfy ground, in a temperature of 6° to 10° Réaumur (about 46° to 55° Fahrenheit). It was also found shortly afterwards by Wagener and Schlim, in woods near Ocaña, at an elevation of 7—8,000 feet, and more recently by Brückmüller, Shuttleworth, and other collectors. Warscewicz's drawing, published by Reichenbach in his "Xenia Orchidacea," represents a very large flower, larger, probably, than any yet produced in

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Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column ;—1a, section of ovary ;—2, petal, inner side ;—2a, side of petal ;—3, lip ;—3a, base of lip, showing nectaries ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size.*

cultivation. The first plants which flowered in this country were imported by Messrs. Veitch in 1874, from Frontino in Antioquia, and when Professor Reichenbach received from Mr. Veitch rather small fresh flowers from these plants, he gave them the specific name *Gargantua*, failing to identify them with the dried specimens to which, more than twenty years before, he had given the name *elephanticeps*. His description of the colouring of *M. Gargantua* agrees exactly with that of *M. elephanticeps*, the "three pale whitish stripes on each side" being the opaque prominent nerves, through which the ruddy crimson within the flower is not apparent. The plant is now grown in many collections of Masdevallias under the two names, the flowers being always identical.

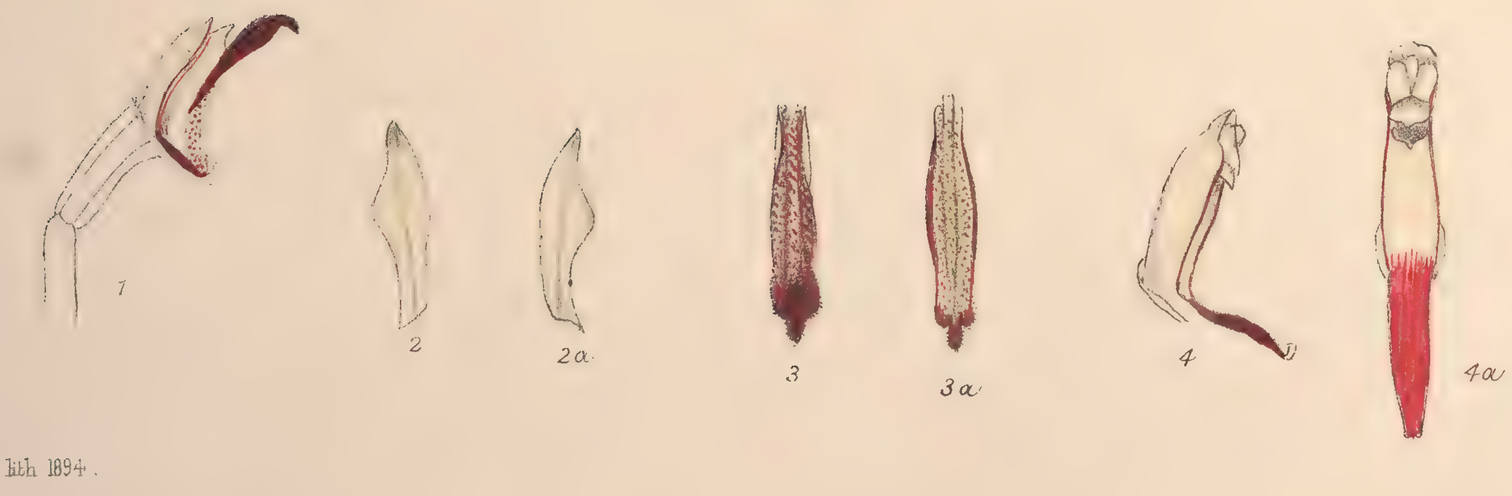
In describing the fresh flowers Reichenbach notices their strong disagreeable smell —a characteristic which must of course have been absent from the dried specimens. This odour is perceptible at some distance from the plant, and so exactly resembles that of tainted meat that it speedily attracts flies. It is most powerful when the flowers first open, and ceases gradually before they fade. I have myself observed that flies had even deposited their eggs upon the surface of the flower, but when the young grubs hatched, they failed to find sustenance in its tissues, and perished. Although the odour must be intended to attract some insect suitable for fertilising the flower, I could not perceive any method by which flies or their larvæ could effect this purpose, or that they could by any possibility remove the rather strongly attached anthers. Some more vigorous insect —possibly a beetle—doubtless exists in the native habitat of this plant, specially adapted for the fertilisation of the flower, and attracted towards it by the peculiar odour which it emits.

It was with an importation of *M. elephanticeps* made by Mr. Bull from Ocaña, that our new species *M. fragrans* was introduced. The plant remained in his collection until purchased by the Marquess of Lothian as *M. elephanticeps*, for which it continued to be mistaken until the appearance of its pale yellow fragrant flowers proved its distinctness.

Reichenbach's *M. elephanticeps var. pachysepala* is no doubt identical with *M. Mooreana*, of which a Plate follows in due order.

Mr. Lehmann adds the following information:

Masdevallia elephanticeps has rather an extensive distribution over the northern parts of Colombia, but always seems to occur but sparingly. In the State of Santander it is chiefly met with around Ocaña, and in Antioquia it is to be found in the wood between Guarne and Santo Domingo. In both localities the elevation is from 1,800 to 2,100 mètres above sea-level (5,850 to 6,825 feet), and I think that it was from the latter place that the plants named by Reichenbach *M. Gargantua* were found. It grows on trees near the ground, and sometimes also upon the steep rocky sides of deep ravines.



F.C. Lehmann del.
Florence H. Woolward lith 1894.

Hanhart imp.

MASDEVALLIA FRACTIFLEXA, *sp. nov. Lehm. et. Kränz.*

MASDEVALLIA FRACTIFLEXA

sp. nov. Lehm. et Kränz. MS.

Masdevallia fractiflexa, sp. nov. Lehm. et Kränz. MS. Planta cæspitosa; folio oblongo-lanceolato, coriaceo, margine revoluto, apice tridenticulato, viridi, in petiolum sulcatum robustum sensim angustato, basi vaginato; pedunculo unifloro, tereti, erecto, curtiore quam folio, basi bracteis vaginantibus vestito, viridi, rubro-maculato; bractea sub flore membranacea, supra ovata, infra vaginanti, apiculata; ovario costato, viridi, rubro-maculato; sepalis in tubum constrictum connatis, basi in mentum producto, carnosis, limbis ovatis, trinerviis, in caudas triquetras sensim elongatis, abrupte reflexis, viridi-luteis, exteriore minute transverse rubro-striato, caudis coccineis; petalis linearibus angulatis, pallide luteis, apice viridi acuto; labello lineari, margine revoluto, pallide luteo, coccineo maculato, apice trilobato, coccineo, papilloso; columna petalis æquilonga, apiculata, pallide lutea, rubro marginata, pede rubro.—Species nova sectionis *Coriaceæ* Rchb. f.—Hab. Ecuador. Lehm. Herb. 10,020.

Leaf about 10 inches long, oblong-lanceolate, coriaceous, apex tridenticulate, green, narrowing below into a grooved petiole, sheathed at the base.

Peduncle, including the pedicel, about 4 inches long, terete, ascending from the base of the petiole, with several sheathing bracts, green spotted with crimson; flowering bract $\frac{3}{4}$ inch long, membranous, apiculate, sheathing below, green, tinged and spotted with crimson.

Ovary $\frac{5}{8}$ inch long, with six rounded angles, green, with small crimson spots.

Sepals cohering for about $\frac{3}{4}$ inch, forming a narrow tube, gibbous below, 3-nerved, coriaceous, pale yellow, with numerous small transverse crimson spots on the exterior, tapering into slender reflexed crimson tails, about $2\frac{1}{4}$ inches long.

Petals about $\frac{1}{2}$ inch long, linear, angled at the margin, apiculate, pale yellow, with a pale green apex and central line.

Lip about $\frac{1}{3}$ longer than the petals, united by a hinge to the curved foot of the column, linear, margins recurved, apex tri-lobed, pale yellow spotted with crimson, the apex covered with small papillæ.

Column equalling the petals, apiculate, pale yellow, with the margin and foot bright crimson.

THIS very rare and interesting plant was discovered by Mr. Lehmann in 1876, in the Eastern Andes of Loja, the most southern province of Ecuador. It was named by him and his friend Dr. Kränzlin, of Berlin, in allusion to the abruptly reflexed tails of the sepals. The exact locality is stated by Mr. Lehmann, as follows:

I discovered plants of *M. fractiflexa* as long ago as November, 1876, but for many years I never saw the flower. In December, 1890, I found one flower only, and two years afterwards, I was so fortunate as to find a large number of plants in flower, enabling me to make careful drawings and observations. As a species it is very characteristic and easily to be distinguished, and, with its pretty and curious flowers, would deserve a place in any collection of Orchids.

Of all Masdevallias which I have observed, this is the rarest, and although I have spent many months in exploring every accessible part of the Eastern Andes, I have hithérto found comparatively few specimens of it, and those only in one place. This locality is called "El Dictamno," and is situated on the descent from the Eastern Andes, about half-way between Loja and Zamora, at an elevation of 1,800 mètres (5,850 feet). The plant grows on trees, from eight to sixteen feet from the ground, in very damp thick woods, and in a region where, during the whole year, there are very few days without rain.

Explanation of Plate, from a drawing by Mr. Lehmann:

Fig. 1, petal, lip, and column, *natural size*;—2, petal, outer side;—2a, petal, from the inner side;—3, lip;—3a, back of lip;—4, column;—4a, front of column; *all enlarged.*

Florence H. Woolward del. et lith. 1892.

M&N. Hanhart imp.

MASDEVALLIA FRAGRANS, *sp. nov.*

MASDEVALLIA FRAGRANS, sp. nov.

Masdevallia fragrans, sp. nov. Planta dense cæspitosa ; folio oblongo-lanceolato, rigido crasso, apice obtuse tridenticulato, viridi pulchro, nerviis lateralibus clarioribus, in petiolum robustum sensim angustato, basi vaginato ; pedunculo unifloro, tereti, erecto, viridi, rubro-maculato, multo curtiore quam folio ; pedicello pedunculo æquilongo, viridi pallidiore ; bractea fusca membranacea, supra ovata, infra amplexanti ; ovario costato, glabro, viridi, rubro-maculato ; sepalis in tubum extensum connatis, mento infra obtuso, triangulis, trinerviis, in caudas carnosas planas elongatis, citrinis, exteriore nerviis rubro-maculatis, nerviis sepali imparis rubris, sepalis lateralibus intus molliter pilosis, caudis flavis, viridi tinctis ; petalis basi linearibus, supra oblongis, apiculatis, margine anteriore carnoso angulato, eburneis, linea centrali rubra, apice viridi ; labello lingueformi, basi carnoso, glandulis duabus nectariferis, apice verrucoso, flavo, minute rubro-punctato, lineis rubris tribus ; columna robusta, alis rubris angustis, viridi, intus rubro-striata, apice minute denticulato, pede flavo, rubro-maculato. Flos fragrantissimus et perelegans, qui *M. pachyanthæ* florem magnitudine prope æquat.—Species nova sectionis *Coriaceæ* Rchb. f.—Hab. Ocaña ?

Blade of leaf 5 or 6 inches long, 1 inch wide, oblong-lanceolate, thick and fleshy, apex bluntly tridenticulate, bright shining green, the principal nerves paler, narrowing below into a thick grooved petiole, sheathed at the base.

Peduncle (with pedicel) 3 or 4 inches long, terete, ascending from the base of the petiole, green spotted with crimson ; pedicel about $1\frac{1}{2}$ inch long, very pale bluish-green, with minute crimson spots on the outer side ; bract about $\frac{3}{4}$ inch long, ovate, sheathing below, dull brown.

Ovary nearly $\frac{3}{8}$ inch long, with six rounded angles, green spotted with crimson.

Sepals : dorsal sepal united to the lateral sepals for $\frac{1}{2}$ inch, forming a wide tube, gibbous below, free portion triangular for about $\frac{1}{2}$ inch, 3-nerved, tapering into a flattened fleshy tail nearly $\frac{3}{4}$ inch long ; lateral sepals cohering for about $\frac{3}{4}$ inch, free portion ovate-triangular for $\frac{1}{2}$ inch, with three principal nerves, tapering into fleshy tails $\frac{1}{2}$ inch long ; all the sepals clear lemon-yellow, the tails tinged with canary-yellow and green, the nerves of the dorsal sepal bright crimson, the inner surface of the lateral sepals velvety with numerous short soft hairs.

Petals $\frac{1}{2}$ inch long, linear at the base, oblong above, apiculate, thickened and angled on the anterior margin, thick and fleshy, shining ivory-white, with a broad crimson central nerve, apex greenish.

Lip $\frac{1}{2}$ inch long, tongue-shaped, fleshy at the base, with a small hollow nectary containing honey on each side of the central nerve, anterior portion rough with small papillæ, bright yellow, with a few small crimson spots and three dull crimson lines.

Column $\frac{3}{8}$ inch long, stout, narrowly winged, apex slightly denticulate, pale green, with crimson lines within and with crimson on the wings and apex, foot bright yellow, with small crimson spots.

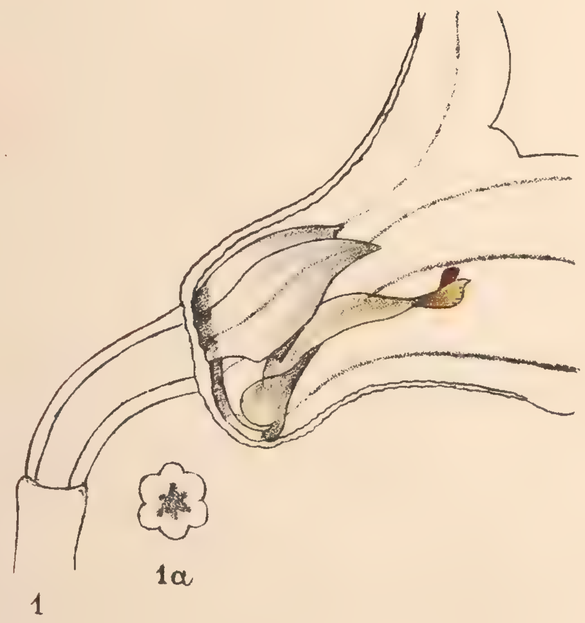
Explanation of Plate, drawn from a plant at Newbattle Abbey :

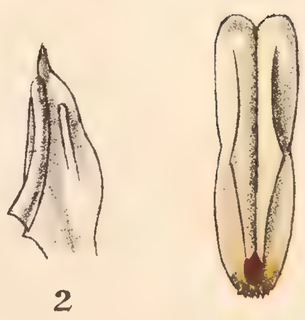
Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, base of lip, showing nectaries (*much enlarged*) ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size.*

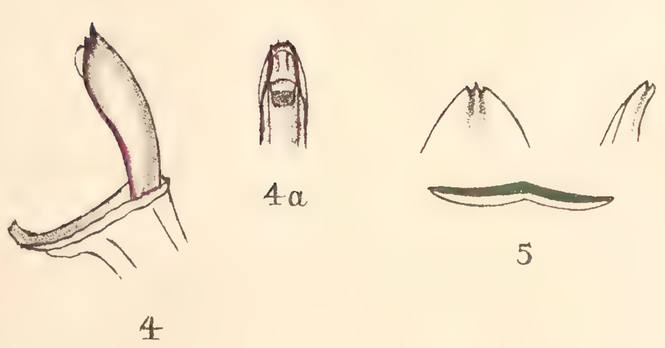
NO certain information can be given as to the habitat or the discoverer of this new species. It was purchased from Mr. Bull in 1887, for the Marquess of Lothian's collection, under the name of *M. elephanticeps*, and until the first flowers appeared, in April 1892, no suspicion of the incorrectness of this name was entertained, the great resemblance between the leaves of the two species justifying those who named the plant. That the flowers of *M. fragrans* do not resemble those of *M. elephanticeps* need hardly be pointed out; the shape and size of the massive flowers of the latter, with their long tails and the dark colouring of their lateral sepals, are sufficient to distinguish the two at a glance.

The habitat of *M. elephanticeps* is Ocaña, in the province of Santander, Colombia, where it grows in woods at an elevation of 6,000 to 10,000 feet. Mr. Bull's plants of *M. elephanticeps* were imported from that locality, and there seems to be little doubt that *M. fragrans* was introduced among them, the two probably growing together, and, when not in flower, so closely resembling one another as to be indistinguishable.

The delicate fragrance of the flowers—an uncommon characteristic throughout the genus *Masdevallia*—suggested our specific name for this plant.







Florence H. Woolward del et lith. 1896

Goater. Imp.

MASDEVALLIA LAUCHEANA *Kränz. Ms.*

MASDEVALLIA LAUCHEANA Kränz. MS.

Masdevallia Laucheana Kränz. MS.—Gardening World vol. XI. (1894), p. 134.

Planta cæspitosa ; folio oblongo-ovato, apice acute denticulato, nervoso, viridi lucido, in petiolum tenuem sulcatum sensim angustato, basi vaginata, pedunculo uniflore, tereti, erecto, tenui, bracteato, ex vagina apud basem petioli emergenti, viridi ; bractea membranacea, supra ovata, apiculata, infra amplexanti, viridi pallido ; pedicello pedunculo æquilongo, tereti, viridi pallido ; ovario costato, viridi ; sepalis in tubum constrictum connatis, mento infra rotundo, triangulis, cucullatis, trinerviis, in caudas carnosis aureis elongatis, albis, nerviis tribus coccineis ; petalis oblanceolatis, apiculatis, margine anteriore crasse angulato, margine posteriore pauce carinato, albis, apice viridi ; labello oblongo, luteo, basi carnosa, carinis duabus angulatis parallelis, in pulvillum coccineum molliter pilosum terminatis, apice minute aspero, aureo ; columna tenui, anguste alata, alba, coccinea-marginata, apice denticulato.—Flos formam illius *M. Wageneriancæ* habet.—Incognitum est qua habitet et quis collegerit.

Leaf 4 or 5 inches long, oblong-ovate, apex acutely tridenticulate, narrowing below into a slender grooved petiole sheathed at the base, bright green.

Peduncle about 2 inches long, terete, slender, erect from the base of the petiole, pale green ; bract nearly $\frac{1}{2}$ inch long, ovate-apiculate, sheathing below, with a minute rudimentary bud within at the base, pale green.

Ovary $\frac{1}{4}$ inch long, curved, with six rounded angles, pale green.

Sepals all cohering for about $\frac{3}{8}$ inch, forming a narrow tube, gibbous below, free portions roundly triangular, 3-nerved, pure white, each with one rose-crimson streak, and all terminating in terete bright orange-tails nearly 1 inch long.

Petals less than $\frac{1}{4}$ inch long, oblanceolate, with a thick angled keel on the anterior margin and a small one near the opposite side, acuminate, pure white with a green apex.

Lip longer than the petals, thickened at the base and united by a hinge to the foot of the column, with two angled longitudinal keels, terminating in a velvety crimson cushion, pale yellow, apex slightly crenate, orange-yellow.

Column shorter than the petals, slender, narrowly winged, apex denticulate, white, with a narrow edge of dark crimson.

ALTHOUGH *Masdevallia Laucheana* has been known in cultivation for five or six years, no drawing or botanical description of it has hitherto been published. It was named by Dr. Kränzlin, of Berlin, in honour of his friend Herr Lauche, of Eisgrub, Austria. I can obtain no information as to its origin or habitat. A very pretty variety is grown in Sir Trevor Lawrence's collection of Masdevallias, which has a rose-coloured spot upon the angle of the dorsal and lateral sepals, and three streaks of the same colour upon the dorsal sepal. The tails of this flower are of a richer orange than those of the type, and the lip is very pale yellow.

Explanation of Plate :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size*.

Florence H. Woolward del. et lith. 1889.

MASDEVALLIA LEONTOGLOSSA *Rchb. f.*

Harbaux imp

MASDEVALLIA LEONTOGLOSSA Rchb. f.

Masdevallia leontoglossa Rchb. f. Bonplandia III. (1855), p. 69 ; Walp. Ann. VI. (1861), p. 191 ; Gard. Chron. 1881, pt. I., p. 234 ; pt. II., p. 336 ; 1885, pt. II., p. 429, fig. 92 ; Veitch Manual Orch. pt. V. (1889), p. 49.

Leaf 6 or 8 inches long, about 1 inch wide, linear-lanceolate, coriaceous, obtusely tridenticulate, dark green, spotted on the base and margin with crimson, narrowing into a grooved petiole sheathed at the base.

Peduncle 1½ or 2 inches long, thick, terete, with two or three sheathing bracts, pale green spotted with bright crimson, descending from the base of the petiole ; flowering bract ⅝ inch long, 3-nerved, ovate, closely sheathing near the base, very pale green spotted with crimson.

Ovary ⅜ inch long, with six rounded angles, green spotted with crimson.

Sepals : dorsal sepal united to the lateral sepals for ½ inch, forming a wide tube, free portion triangular for ½ inch, 3-nerved, semi-transparent, with three crimson nerves, pale greenish-yellow, spotted with crimson on the outer surface and covered with short rigid hairs within, tapering into a fleshy tail 1½ inch long, greenish, with small crimson spots ; lateral sepals cohering for about 1 inch, ovate-triangular, 5-nerved, semi-transparent, pale greenish-yellow, the inner surface covered with short rigid hairs and heavily spotted with crimson, tapering into fleshy tails ¾ inch long, green, with a few small crimson spots.

Petals about ½ inch long, linear at the base, ovate above, anterior margin angled, with a prominent fleshy lobe on the inner surface, shining white, with one or two crimson streaks.

Lip ⅝ inch long, united to the foot of the column by a very flexible hinge, grooved in the centre, with a deep nectary on each side at the base, anterior portion tongue-shaped, whitish, covered with crimson spots, and rough with small papillæ, apex dark crimson, covered with papillæ.

Column ½ inch long, winged, shining white, spotted on the foot and edged with dark crimson, apex minutely denticulate.

MASDEVALLIA LEONTOGLOSSA was first described by Professor Reichenbach in 1855, from dried specimens collected by Hermann Wagener in the neighbourhood of Pericos, in New Granada, at that date one of the three great Republics of Colombia. It first flowered in cultivation at Brussels in 1867, in the collection of Mons. Linden. The downward growth of the short, thick flower-stalks distinguishes it from allied species, and the nectaries at the base of the lip secrete honey in greater abundance than those of any species which I have examined. The lip curiously resembles

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Explanation of Plate, drawn from a Plant at Newbattle Abbey :

Fig. 1, petals, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, petal, side ;—3, lip ;—3a, base of lip, showing nectaries (*much enlarged*) ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of lip, *natural size*.

the tongue of a lion in shape and in the roughness of its surface, and doubtless suggested to Professor Reichenbach the specific name *leontoglossa*.

Consul Lehmann adds the following information :

Masdevallia leontoglossa is found in Colombia, where it grows on trees, and rarely on the ground, in the vicinity of Ocaña, at an elevation of 1,800 to 2,300 mètres (5,850 to 7,475 feet). The temperature of this region is 15° to 18° Centigrade (59° to 64°.4 Fahrenheit).

F. C. Lehmann.

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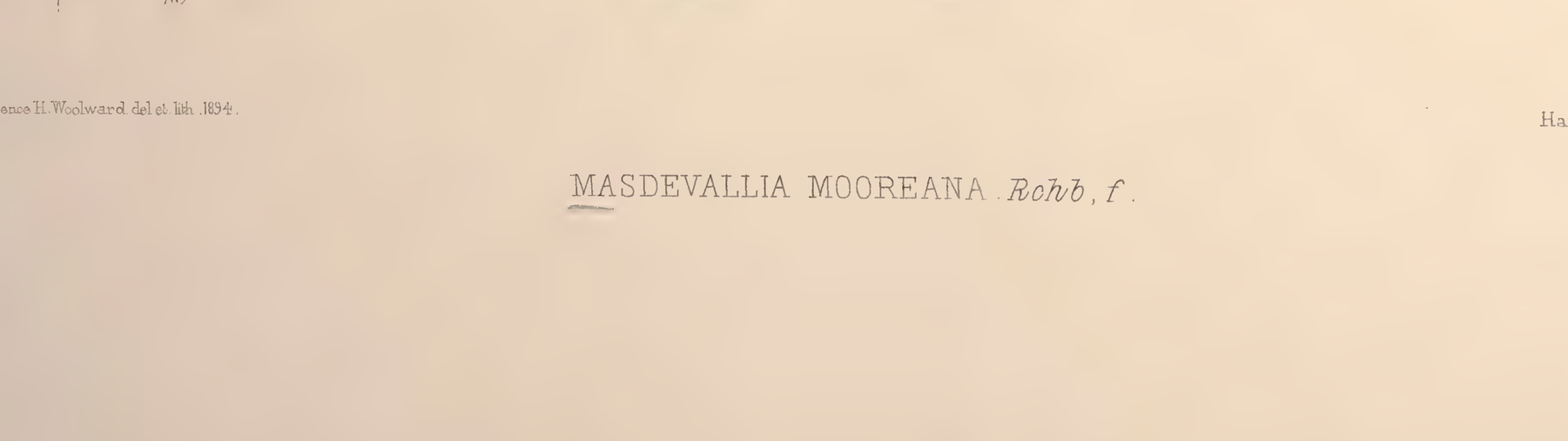

Florence H. Woolward del et lith. 1894.

Hanhart imp.

MASDEVALLIA MOOREANA. *Rchb, f.*

MASDEVALLIA MOOREANA Rchb. f.

Masdevallia Mooreana Rchb. f. Gard. Chron. 1884, pt. I., p. 408 ; 1887, pt. II., p. 777 ; Orchidophile (Godefroy), 1884, p. 134 ; 1888, p. 262 ; Bot. Mag. t. 7015 (1888) ; Veitch Manual Orch. pt. V. (1889), p. 53.

M. elephanticeps var. pachysepala Rchb. f. Bonplandia II. (1854), p. 283 ; Xen. Orch. I. (1858), p. 198, t. 74, figs. III. and IV.

M. sororcula Rchb, f. Gard. Chron. 1887, pt. II., p. 713 ; Orchidophile (Godefroy) 1888, p. 230.

Leaf about 7 inches long, oblong, obtusely tridenticulate, coriaceous, curved, narrowing below into a stout grooved petiole, sheathed at the base, dull purple-green, the young leaves bright shining green, with a few dull crimson spots upon the petiole.

Peduncle scarcely more than ½ inch long, with a pedicel 1 inch long, terete, with two sheathing bracts, ascending from the base of the petiole, green, with small crimson spots ; flowering bract ¾ inch long, apiculate, sheathing below.

Ovary ⅜ inch long, with six rounded angles, dull green.

Sepals : dorsal sepal united to the lateral sepals for about ½ inch, forming a wide tube, gibbous below, free portion ovate-triangular for ¾ inch, 3-nerved, tapering into a flattened fleshy tail 2 or 2½ inches long, pale greenish-yellow, with crimson nerves and yellow tail ; lateral sepals cohering for about 1½ inch, oblong-ovate, 3-nerved, rich purple-crimson, the nerves darker, covered with papillæ, and tapering into flattened tails nearly 2 inches long, usually crossed, pale yellow shaded with crimson.

Petals about ½ inch long, oblong, apiculate, much thickened on the anterior margin, white and shining, with a rich crimson central streak.

Lip a little longer than the petals, tongue-shaped, grooved and fleshy at the base, and united to the curved foot of the column by a flexible hinge, purple-crimson, with darker longitudinal lines, the apex covered with stiff dark hairs.

Column shorter than the petals, narrowly winged, apex denticulate, green, the apex, margin and foot crimson.

THERE has been much doubt as to the specific distinctness of *M. Mooreana*, and frequent confusion between it and *M. elephanticeps*. I have no hesitation in identifying it with Reichenbach's *M. elephanticeps var. pachysepala*, although it is difficult to account for the fact that he afterwards named the same plant *M. Mooreana*. Thirty years, however, elapsed from the time (1854) when he published the earlier name, with a very scanty description of dried specimens sent to him from Ocaña by Warscewicz, until the date of his examination of the specimens which he named *M. Mooreana*—fresh flowers produced from cultivated plants. In 1858 a more detailed description of the same plant was given in his "Xenia Orchidacea" from a coloured drawing sent to him by Wagener with specimens preserved in alcohol. A comparison of Wagener's drawing

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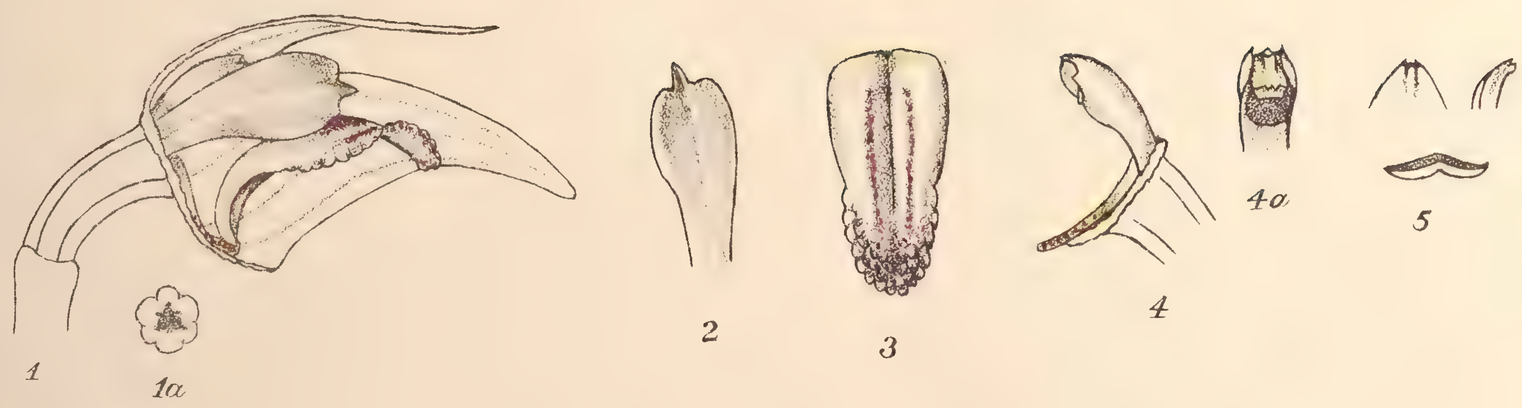
Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, base of lip showing nectaries ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size*.

(Pl. 74 Xen. Orch. I.) with specimens of *M. Mooreana* and *M. elephanticeps* shows that it much more nearly resembles the former than the latter, of which an unmistakeable figure is given at Pl. 3 of the same volume. The long, unspotted, strongly-veined tube of *M. elephanticeps*, its oblong lateral sepals tapering into narrow tails, and especially the unstriped, bright yellow dorsal sepal, clearly distinguish it from *var. pachysepala (M. Mooreana)*, with its short spotted tube and wide flattened tails, and the three conspicuous crimson streaks upon the dorsal sepal.

In describing *M. Mooreana* in 1884, Reichenbach gives no locality or discoverer's name. Accepting it as identical with *M. elephanticeps var. pachysepala* we must, therefore, turn to his account of that plant for information as to its habitat. He states that it was found by Warscewicz, Wagener, and Schlim, in woods near Ocaña, at an elevation of 7 to 8,000 feet.

The plant named by Reichenbach in 1886 *M. sororcula*, cannot be considered specifically distinct from *M. Mooreana*. The flower is rather smaller and more slender in shape, and the wings of the column are a little wider. The yellow of the sepals is slightly greener in shade, but the colouring is otherwise identical.



Florence H. Woolward del et lith. 1896

Goater Imp.

MASDEVALLIA ORTGIESIANA. *hort.*

MASDEVALLIA ORTGIESIANA, hort.

MASDEVALLIA ORTGIESIANA, hort. Orchid Review vol. III. (1895) p. 48.

Planta dense cæspitosa ; folio lineari-lanceolato, rigido, apice tridenticulato, viridi, in petiolum robustum sulcatum sensim angustato, basi vaginata, pedunculo uniflore, tereti, erecto, bracteato, tenuissimo, multo curtiore quam folio, ex basi petioli emergenti, viridi, minute rubro-punctato ; pedicello curtio, tereti, viridi pallido, rubro-maculato ; ovario curvato, costato, viridi, rubro-maculato ; sepalis in tubum vel cyathum connatis, mento infra rotundo, ovatis, trinerviis, in cuspides obtusas planas terminatis, eburneis vel albis, roseo-tinctis, nerviis minute rubro-maculatis vel striatis, cuspidibus viridibus ; petalis lanceolatis, acuminatis, albis, apice viridi ; labello obovato, recurvato, basi sulcata, margine anteriore crenato, apice verrucoso, albo, lineis roseis tribus parallelis ; columna curta, anguste alata, alba, apice tridenticulato.—Flore minore quam illo *M. striatellæ*, sed illi affini.—Incognitum est qua habitet et quis collegerit.

Leaf about 4 inches long, linear, stiff and fleshy, tridenticulate, narrowing below into a stout grooved petiole, sheathed at the base, green.

Peduncle 2 inches long, terete, very slender and wiry, with two sheathing bracts, erect or semi-lateral from the base of the petiole, green, with minute crimson spots ; flowering bract $\frac{1}{4}$ inch long, membranous, apiculate, sheathing below, brownish.

Ovary about $\frac{1}{8}$ inch long, curved, with six rounded angles, pale green, with minute crimson spots.

Sepals about $\frac{1}{2}$ inch long, all cohering almost equally for $\frac{1}{8}$ inch, forming a wide open tube, rounded below, free portions oblong-ovate, 3-nerved, ivory-white or pale pink, with a few rose-coloured spots, especially along the nerves, and all tapering into flattened fleshy green points.

Petals about $\frac{1}{4}$ inch long, linear-oblong, apiculate, white, apex green.

Lip longer than the petals, thickened and grooved at the base and united by a hinge to the foot of the column, oval-oblong, white, with three rose-coloured lines, anterior portion covered with asperities, pinkish.

Column much shorter than the petals, winged, white, apex denticulate.

THROUGH the kindness of Mr. F. W. Moore I have the opportunity of publishing a drawing of the only known plant of *Masdevallia Ortgiesiana*, and although I have endeavoured in every way to ascertain its habitat and discoverer, the information which I have been able to obtain is of the scantiest. In 1891 the plant was purchased by Mr. Moore from Messrs. Seeger and Tropp—a firm which has now ceased to exist—and they had received it "from the Continent." Even Mons. Ortgies, of Zürich, after whom the plant is named, and to whom I have applied for information, can tell me nothing of its origin, or of the unknown friend who named it in his honour. No botanical description of the species has hitherto been published, and only a short account of it is given in the Orchid Review for Feb. 1895, of flowers from Mr. Moore's plant. The nearest ally of *M. Ortgiesiana* is *M. striatella*, but in that species the large development of the lip and petals in proportion to the size of the sepal-tube is rather less remarkable. In neither of these two little plants—the smallest of their group—is there any sign of a nectary at the base of the lip, and in placing them in the Section *Coriaceæ* I am following Professor Reichenbach, who classed *M. striatella* with *M. campyloglossa*.

The woodcut is taken from a photograph kindly supplied by Mr. Moore.

Explanation of Plate drawn from a plant in the Royal Botanic Gardens, Glasnevin, Dublin :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf ; *natural size*.

Florence H. Woolward del. et lith. 1894.

Hanhart imp.

MASDEVALLIA PACHYANTHA *Rchb. f.*

MASDEVALLIA PACHYANTHA Rchb. f.

MASDEVALLIA PACHYANTHA Rchb. f. Gard. Chron. 1884, pt. I., p. 174 ; Orchidophile (Godefroy) 1884, p. 100 ; Flora (Singer) 1886, p. 561 ; Veitch Manual Orch. V. (1889), p. 56.

Leaf 4 or 5 inches long, oblong-ovate, obtusely tridenticulate, coriaceous, dark green, narrowing below into a thick grooved petiole, sheathed at the base.

Peduncle about 3 inches long, including the pedicel, which is nearly 1 inch long, terete, with two sheathing bracts, ascending from the base of the pedicel, green spotted with red ; flowering bract $\frac{1}{2}$ inch long, membranous, apiculate, sheathing, brownish.

Ovary $\frac{1}{4}$ inch long, with six rounded angles, very shining, pale green tinged with brown.

Sepals : dorsal sepal united to the lateral sepals for $\frac{1}{4}$ inch, forming a wide cup, free portion triangular-ovate for about $\frac{1}{2}$ inch, 3-nerved, tapering into a slender fleshy tail $\frac{3}{4}$ inch long, honey-yellow, semi-transparent, with numerous minute crimson dots and crimson nerves, tail bright yellow ; lateral sepals cohering for nearly 1 inch, gibbous below, broadly ovate for $\frac{3}{4}$ inch, 3-nerved, terminating in flattened tails $\frac{1}{2}$ inch long, honey-yellow covered with soft minute amethyst-crimson hairs and spots, especially upon the nerves, tails dull green.

Petals about $\frac{3}{8}$ inch long, ovate-oblong, thickened at the margins, very shining, with viscid matter within near the base, apiculate, pale yellow, with one crimson central streak.

Lip $\frac{1}{2}$ inch long, oval-oblong, much curved, very thick and fleshy, with two very thick keels or ridges terminating half way, dull mottled crimson, apex rough with papillæ, dark crimson-purple.

Column $\frac{3}{8}$ inch long, narrowly winged, green, edged with crimson, apex denticulate, crimson.

MASDEVALLIA PACHYANTHA was first described by Professor Reichenbach in 1884, from specimens sent to him by Messrs. Carder and Shuttleworth, in whose collection it flowered for the first time in cultivation. Whether the original discoverer of this species was Mr. Cross or Consul Lehmann seems uncertain, for Reichenbach states that he had specimens "a long while ago," collected by Mr. Cross ; adding, "Lehmann also wrote to me about it long ago."

In the British Museum of Natural History there are dried specimens collected by Mr. Lehmann in 1881 on the western slopes of the Central Cordilleras of Popayán, at an elevation of 3,000—3,500 mètres (9,500 to 11,375 feet), and others found by him in 1882, growing upon trees in damp mountain woods on the western slopes of the Paramo de Moras, at an elevation of 3,000 mètres.

The plant here represented is rather a small specimen, and in the collection at Glasnevin, Dublin, both leaves and flower-stalks attain a greater length.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size.*

Mr. Lehmann sends the following note :

Masdevallia pachyantha is restricted to the western slopes of the Central Andes of Popayán and Pasto, from 1° to 3° north of the equator, at an elevation of 2,900 to 3,300 mètres (9,425 to 10,725 feet). It grows on trees in the thick damp forests of the upper Andes, and also on walls of volcanic rocks forming the sides of steep ravines. With the exception, perhaps, of *M. racemosa*, it is the commonest of all Masdevallias, sometimes entirely covering the trunks of trees from the ground up to a considerable height. I have observed it on the slopes of the Páramo de Moras, and on the Páramo de las Delicias and Guanácas, upon the volcano of Puracé, in great abundance on the Páramo de Barbillas, on the volcano of Tajumbina, and in numerous other localities.

M. pachyantha is a very variable species, and the flowers of plants found near Pasto are nearly double the size of those growing on the volcano of Puracé, and are heavily blotched—not streaked—with dark purplish-brown. The largest plants and flowers come from the Páramo de Barbillas, and these finely developed specimens in all respects justify the name *pachyantha (thick flower)*. Among the plants growing on the Páramo de las Delicias and Guanácas there is a variety with rather small pale yellow flowers.

The climate of the habitat of *M. pachyantha* is remarkable for its excessive and continual dampness, with a clouded foggy atmosphere and extremely cold winds. There is only a short interval, from January until March, when little or no rain falls, and at this time instead of rain dense fogs prevail, rising just above the forests and enveloping them in constant mist and twilight. During the rest of the year there are heavy rains, with sharp east winds, the temperature often falling as low as 1° above zero Centigrade (33°.8 Fahrenheit). The average temperature is between 10° and 11°.5 Centigrade (50° and 51°.8 Fahrenheit).

As a wild plant *M. pachyantha* flowers most profusely, often lasting from September until May.

MASDEVALLIA PERISTERIA Rchb. f.

Masdevallia Peristeria Rchb. f. Gard. Chron. 1874, pt. I., p. 500; 1881, pt. II., p. 336; Bot. Mag., t. 6159; Flore des Serres, 1877, vol. XXII. t. 2346; Illustr. Hort. 1878, vol. XXV. ser. 3, t. 327, p. 152.

Leaf about 5 inches long, linear-lanceolate, thick and fleshy, tridenticulate, narrowing below into a slender petiole, dark green, sheathed at the base.

Peduncle 2½ inches long, terete, ascending from a joint near the base of the petiole, with two sheathing bracts, pale green, sometimes spotted with crimson; flowering bract ½ or ¾ inch long, 3-nerved, sheathing below, ovate and apiculate above, pale green or brownish, and having within at the base a small rudimentary flower-bud.

Ovary ½ inch long, curved, with six rounded angles, bright green and shining.

Sepals: dorsal sepal united to the lateral sepals for about ¾ inch, forming a wide tube, gibbous beneath; lateral sepals cohering for nearly 1¼ inch; all triangular-ovate, 3-nerved, greenish-yellow with numerous dark crimson spots, and tapering into fleshy tails about 1¼ inch long, flattened at the base, triquetrous towards the apex, yellow, greenish at the back.

Petals about ½ inch long, oblanceolate, curved, fleshy, shining, pale green, sometimes with a few brown spots, apex minutely denticulate, anterior margin slightly keeled, with colourless viscid matter beneath.

Lip ½ inch long, pandurate, base fleshy and deeply grooved, with a small concave nectary on each side, centre with two longitudinal elevated lines, and two rugose lateral keels, greenish white, spotted and margined with deep purple, apex much reflexed, crenate and rough with numerous dark crimson papillæ.

Column nearly ½ inch long, broadly winged, attenuate below, green, foot rich crimson, apex white, slightly denticulate.

THERE appear to be two or three varieties of *Masdevallia Peristeria*, although none of them are very strikingly distinct in their characteristics. Consul Lehmann informs me that the original form described by Professor Reichenbach (Gard. Chron. 1874, pt. I., p. 500) is not now in cultivation, and that it differed from the variety universally known in collections and figured in the accompanying plate, in having more brightly coloured flowers and longer tails. A coloured sketch in my possession, drawn by Consul Lehmann in the actual habitat of the plant, of the variety which he considers to have been the first introduced into Europe, represents the flowers of a bright golden yellow spotted with crimson-purple, and having yellow tails nearly two inches long and more slender than those of the best-known variety.

M. Peristeria was first imported from Colombia in 1873, by Gustav Wallis, while collecting for Messrs. Veitch, who supplied Professor Reichenbach with the fresh flowers named and described by him in 1874. On referring to Mr. H. Veitch for information respecting the appearance of these first imported plants, I cannot, however, learn that they differed in any way from the variety now in cultivation.

Professor Reichenbach appears to have suspected the existence of two varieties of *M. Peristeria*, for he remarks (Gard. Chron. 1874, pt. I., p. 500): "If this plant has ever been observed before, it was by my friend Wagener, in Venezuela. I have a sketch of

his much like this, but, since no specimen was added, I, of course, never named it. The tails of the perigone, however, are represented as green, and the flower is much smaller." This description agrees well with the appearance of a small variety now in cultivation in the Royal Botanic Gardens at Glasnevin, Dublin, a specimen of which has been kindly sent to me by Mr. F. W. Moore for examination, with the information that the plant had been named for him by Professor Reichenbach *Masdevallia Peristeria* var. minor.

The locality first mentioned by Consul Lehmann in the following note is, he informs me, the habitat whence plants of *M. Peristeria* were first imported to Europe. The second locality mentioned is the habitat of the plant now known in cultivation, to which he refers as "A peculiar variety."

Masdevallia Peristeria Rchb. f. grows on trees in park-like woods near Caldas, near Medellin, and also about Carolina in the department of Antioquia, at an elevation of 1,800 to 2,200 mètres (5,850 to 7,150 feet). A peculiar variety grows about Pususquar, on the road from Tuquerres to Barbacoas, in the southern part of the department of the Cauca, at an elevation of 1,600 mètres (5,200 feet).

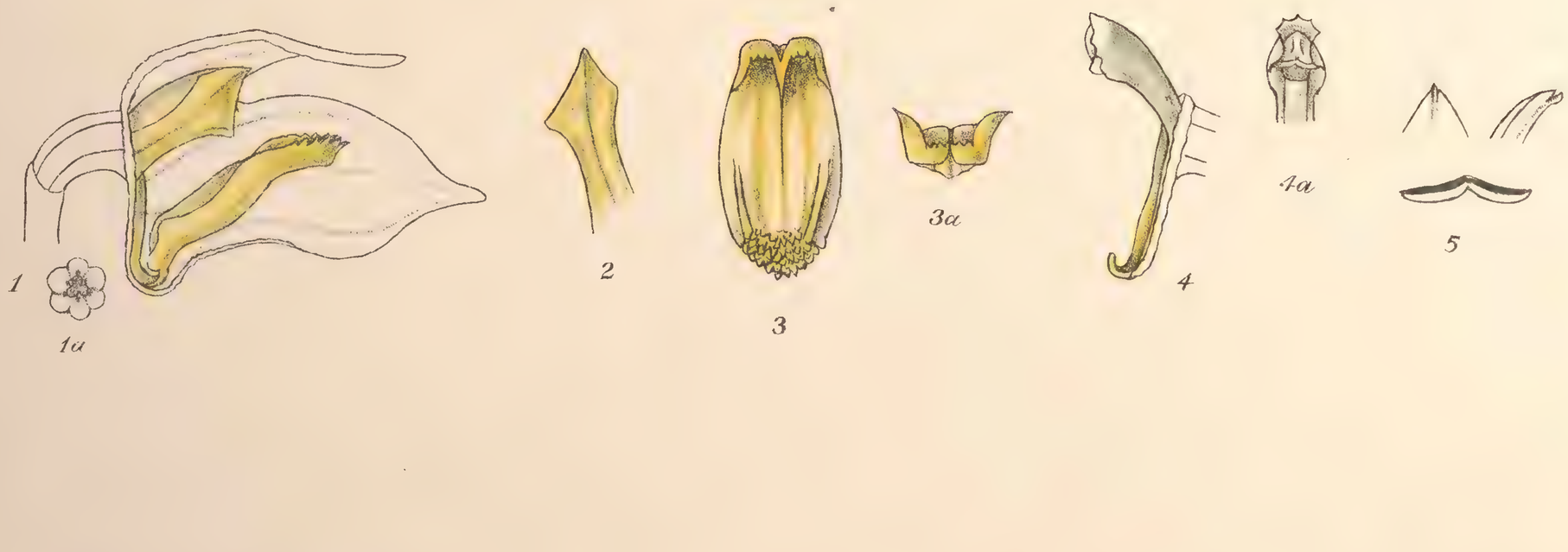
The plant grows most commonly near the ground on the trunks of trees, chiefly oaks, in open woods or by the river-sides, where a free circulation of air takes place. It attains its largest development when growing on the decayed trunks of oak-trees lying on the ground. Its appearance is confined to small areas, but wherever it is to be found it grows in great abundance. In some localities, favourable to the requirements of the plants, fully one half of the flowers produce seed-pods, while in less congenial localities seed-pods are very rarely to be met with.

In Antioquia *M. Peristeria* flowers from October to December, and in the Cauca in January and February.

F. C. Lehmann.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petals, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, apex of lip ; *all enlarged ;*—3b, base of lip showing nectaries, *much enlarged ;*—4, column ;—4a, apex of column ; *enlarged ;*—5, apex and section of leaf, *natural size.*



Florence H. Woolward del et lith. 1896

Goater Imp.

MASDEVALLIA PLATYGLOSSA *Rchb. f.*

MASDEVALLIA PLATYGLOSSA Rchb. f.

Masdevallia platyglossa Rchb. f. Gard. Chron. 1882, pt. II., p. 552; 1887, pt. II., pp. 717 and 787; Orchidophile (Godefroy) 1882, p. 471; Veitch Manual Orch. pt. V. (1889), p. 57; Bot. Mag. t. 7185 (1891).

Leaf about 3 inches long, oblong-lanceolate, coriaceous, apex acutely tridenticulate, dark green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle 1½ or 2 inches long, terete, attenuate towards the base, descending or lateral from the base of the petiole, with two or three sheathing bracts, pale green; flowering bract ⅜ inch long, membranous, sheathing below, ample above, concealing the short pedicel and the base of the ovary, with a minute rudimentary bud within at the base, very pale green.

Ovary ¼ inch long, curved, with six rounded angles, pale green.

Sepals: dorsal sepal united to the lateral sepals for about ¼ inch, forming a wide tube, gibbous beneath, free portion triangular for nearly ½ inch, 3-nerved, the central nerve strongly carinate, terminating in a blunt fleshy tail $\frac{3}{16}$ inch long; lateral sepals cohering for ¾ inch, free portions ovate-triangular, 3-nerved, terminating in blunt tails or points scarcely ⅛ inch long; all lemon-yellow, with pale green nerves, the surface slightly velvety.

Petals nearly ⅜ inch long, oblong at the base, triangular at the apex, the anterior angle much prolonged, fleshy, shining, pale clear yellow, with a greenish central line.

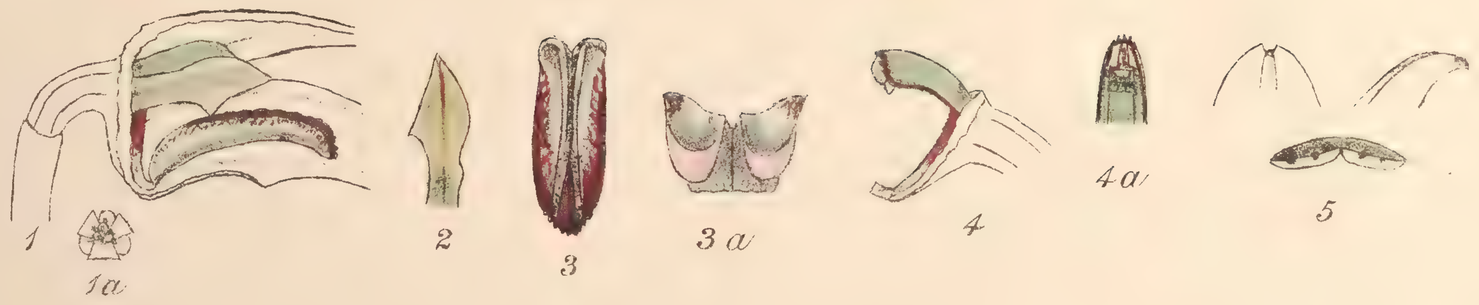
Lip more than ½ inch long, united to the foot of the column by a flexible hinge, base grooved and fleshy, with a deep nectary on each side, oval-oblong, with two short longitudinal keels, pale yellow, with darker nerves, the apex covered with large acute papillæ.

Column nearly ⅜ inch long, broadly winged, pale green, the curved foot yellow, apex crenate, widely spreading, white.

IT is uncertain who was the discoverer of *Masdevallia platyglossa*. Its habitat is in Antioquia, but the exact locality is unknown. The plant first flowered in cultivation in the collection of Sir Trevor Lawrence, in 1882, and was named by Professor Reichenbach *platyglossa*, or "flat-tongue," in allusion to the broad flat lip, fig. 3 in the accompanying Plate. This feature is unusually large compared with the other parts of the flower, and is especially remarkable for the great development of the nectaries at the base.

Explanation of Plate, drawn from a plant at Newbattle Abbey.:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, base of lip, showing nectaries;—4, column;—4a, apex of column; *all enlarged;*—5, apex and section of leaf, *natural size*.



Florence H.Woolward del et lith.1894.

Gcater, Imp

MASDEVALLIA PORCELLICEPS *Rchb. f.*

MASDEVALLIA PORCELLICEPS Rchb. f.

MASDEVALLIA PORCELLICEPS Rchb. f. Gard. Chron. 1883, pt. I., p. 10; Orchidophile (Godefroy) 1883, p. 567.

Leaf about 5 inches long, oblong-lanceolate, obtusely tridenticulate, very coriaceous, narrowing below into a grooved petiole, sheathed at the base, dark green.

Peduncle, including the pedicel, about 1½ inch long, terete, lateral from the base of the petiole, with two sheathing bracts, green, with crimson spots; flowering bract ½ inch long, sheathing below, ovate-acuminate above, pale green, spotted with crimson when young, brownish-green later.

Ovary about ¼ inch long, curved, with three rounded and three flattened lobes, pale green, with a few crimson spots.

Sepals: dorsal sepal united to the lateral sepals for rather more than ¼ inch, forming a narrow tube, gibbous at the base, free portion oblong-triangular, tapering into a flattened fleshy tail about ⅜ inch long; lateral sepals cohering for nearly ⅜ inch, oblong-ovate, tapering into fleshy tails ¼ inch long; all 3-nerved, the principal nerves prominent on the outer surface, pale yellowish-green, covered with crimson spots, chiefly upon the inner surface, which also shows numerous patches of crimson hairs.

Petals nearly ⅜ inch long, oblong-ovate, angled on the anterior margin, pale green, with one short crimson streak in the centre.

Lip nearly 1 inch long, united to the foot of the column by a flexible hinge, tongue-shaped, with a hollow nectary on each side of the base containing much honey, whitish or very pale green, with crimson spots along the sides, and having two obscure lateral keels terminating in an oval cushion at the apex, which is crimson and covered with minute papillæ.

Column short and stout, narrowly winged, foot curved, apex denticulate, pale green winged and tipped with crimson.

THIS small species, one of the least interesting and attractive of the genus, was first described by Professor Reichenbach in 1883, from specimens sent to him by Mr. James O'Brien.

The name "*porcelliceps*" was chosen by Reichenbach on account of a fancied resemblance in the shape of the buds to that of a young pig's head. In general appearance and in the downward or lateral growth of the flowers it is closely allied to *M. leontoglossa*, and but for certain specific differences it might almost be taken for a miniature form of that species.

I am unable to obtain any information as to its habitat.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, base of lip, showing nectaries *(much enlarged)*;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

Florence H. Woolward del et. lith 1894.

Hanhart imp.

MASDEVALLIA STRIATELLA. *Rchb. f.*

MASDEVALLIA STRIATELLA Rchb. f.

Masdevallia striatella Rchb. f. Gard. Chron. 1886, pt. II., p. 103 ; Orchidophile (Godefroy) 1886, p. 306.

Leaf 3 or 4 inches long, oblong-lanceolate, coriaceous, apex tridenticulate, bright green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle about 2½ inches long, terete, very slender, ascending from the base of the petiole, pale green ; bract ¼ inch long, membranous, apiculate, with a minute rudimentary bud within at the base, pale yellowish-green.

Ovary $\frac{3}{16}$ inch long, with six grooves, bright green.

Sepals: dorsal sepal united to the lateral sepals for nearly ⅜ inch, forming a wide tube, gibbous below, free portion triangular-ovate for $\frac{3}{16}$ inch ; lateral sepals cohering for nearly ½ inch, free portions triangular-ovate for ¼ inch ; all 3-nerved, dull white, semi-transparent, with three bright crimson streaks, and all tapering into flattened fleshy tails $\frac{3}{16}$ inch long, yellowish-olive, sometimes greenish.

Petals ¼ inch long, oblanceolate, with an angle on the anterior margin, apiculate, very pale pink, with a broad central crimson streak, apex green.

Lip rather more than ¼ inch long, oblong, the basal half lobed, anterior half with two longitudinal keels, dull pink, with crimson spots on each side, and three central crimson streaks, the base and apex yellowish.

Column nearly equalling the petals, white margined with crimson, apex with four crimson teeth.

THE first plant of *M. striatella* known in cultivation was one imported in 1883 by Mr. James O'Brien, and given by him to Mr. Lee, of Downside, Leatherhead, in whose collection it flowered in 1886, supplying the specimens first named and described by Professor Reichenbach.

A larger importation of this species was afterwards made by Messrs. Sander, from Tovar, in Venezuela, but no details of the exact elevation and temperature are forthcoming.

The following information has been received from Mr. Lehmann :

Masdevallia striatella is confined to the central mountains of Antioquia and the northern districts of the Cauca, where it is distributed over a large area, and extends vertically from 2,000 to 2,500 mètres (6,500 to 8,125 feet) above the level of the sea. The principal localities of its habitat in the Cauca are : in the forests of Mishmish, Guatica, El Arrayanal, and on the eastern slopes of the Alto de Tatamá. In Antioquia it is found in the woods of the undulating mountains around Pácora, Aguadas, Sonson and Mesopotamia ; in the mountains of El Retiro, and on the Alto de San Miguel between Santa Barbara and Caldas ; in many places on the highlands of Santa Rosa de Osos, near San Pedro, on the banks of the Rio Chico, and between Santa Rosa and El Yarumal.

It is generally a common but very local species, growing abundantly in small isolated woods, and then not to be found for many miles. It grows in damp shady woods upon trees near the ground, but also upon Liana-like shrubs of *Thibaudia* and other *Ericaceæ*, in an average temperature of 14° to 16° Centigrade (57°.2 to 60°.8 Fahrenheit). In the Cauca and in the southern parts of Antioquia *M. striatella* flowers in October and November, and in the north of Antioquia during May and June.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size*.

Lawrence H. Woolward del et lith. 1889.

M&N. Hanhart imp.

MASDEVALLIA TORTA *Rchb. f.*

MASDEVALLIA TORTA Rchb. f.

MASDEVALLIA TORTA Rchb. f. Gard. Chron. 1883, pt. I, p. 110 ; Orchidophile (Godefroy), vol. I. (1883), p. 795.

Leaf 6 or 8 inches long, oblong-ovate, carinate, apex tridenticulate, much recurved, dark green, narrowing below into a slender grooved petiole, pale green spotted with crimson.

Peduncle, including pedicel, 3 or 4 inches long, slender, erect, with two or three sheathing bracts, very pale green spotted with crimson ; flowering bract $\frac{3}{4}$ inch long, 3-nerved, sheathing below, ovate and apiculate above, pale greenish-brown.

Ovary about $\frac{3}{8}$ inch long, with six rounded angles, whitish spotted with crimson.

Sepals : dorsal sepal united to the lateral sepals for nearly $\frac{1}{2}$ inch, forming a wide gibbous tube, ovate-triangular for about $\frac{5}{8}$ inch, 5-nerved, semi-transparent, pale greenish-yellow, with red spots and dark red nerves ; lateral sepals cohering for 1 inch, oblong-ovate, with 5 bifurcated nerves, bright red with dark red nerves, and spotted externally with red ; all narrowing into slender, flattened, yellow tails, that of the dorsal sepal $\frac{3}{4}$ inch, and those of the lateral sepals $\frac{1}{2}$ inch long.

Petals $\frac{1}{2}$ inch long, oblong-ovate, thick and fleshy, broadly angled within on the anterior margin, with viscid matter below the angle, apiculate, shining, pale yellow, with two crimson central lines.

Lip $\frac{5}{8}$ inch long, cleft at the base, with a minute rounded nectary on each side, tongue-shaped, closely covered with minute silver-white hairs, purple-crimson; with one central and two lateral dark purple nerves, apex covered with small papillæ.

Column $\frac{1}{2}$ inch long, pale green, edged and spotted on the foot with crimson, and having four or five crimson lines down the inner surface, apex denticulate.

VERY little information can be gathered concerning *Masdevallia torta*, even the name of its discoverer being unobtainable. It was first imported from Colombia for Mr. Bull, and from his collection the specimens described in 1883 by Professor Reichenbach in the Gardeners' Chronicle were supplied. It appears still to be rather a scarce and little-known species, and even to be confused with *M. leontoglossa*, although a very slight examination of the two species would immediately prove their distinctness.

I am informed by Consul Lehmann that he has found flowers of *M. torta* with longer tails than those in the accompanying plate, and that in these flowers the tails are sometimes twisted, in this respect resembling the specimens described by Professor Reichenbach, which suggested to him the name of "torta."

Consul Lehmann gives the habitat of this species in the following note :

Masdevallia torta grows in dense and damp woods, upon trees which are thickly covered with mosses, near El Retiro, in the department of Antioquia, at an elevation of 2,200 to 2,400 mètres (7,150 to 7,800 feet) above the sea. It flowers in October and November. The annual average temperature of this region is from 15° to 16° Centigrade (59° to 60°·8 Fahrenheit).

F. C. LEHMANN.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petals, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, base of lip, showing nectaries *(much enlarged)* ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size*.

M. Woodward del. et lith. 1894.

Goater, imp.

MASDEVALLIA VELIFERA *Rchb. f.*

MASDEVALLIA VELIFERA Rchb. f.

MASDEVALLIA VELIFERA Rchb f. Gard. Chron. 1874, pt. I., p. 406 *(nomen tantum)*; pt. II., p. 98; 1878, pt. II., p. 364 *(errore valifera)*; 1881, pt. II., p. 409 *(errore vilifera)*; 1887, pt. I., p. 744, fig. 142; Orchidophile (Godefroy) 1883, p. 543, with fig. p. 544; Veitch Manual Orch. pt. V. (1889), p. 69.

Leaf 6 or 8 inches long and about 1 inch wide, oblong-lanceolate, very thick and rigid, apex obtusely tridenticulate, very dark green.

Peduncle about 3 inches long, terete, ascending from a joint at the base of the petiole, with two or three sheathing bracts, bright green; flowering bract 1 inch long, sheathing below, apiculate, 3-nerved, pale green or yellowish, with a minute rudimentary bud within at the base.

Ovary ½ inch long, curved, with three broad and three narrow rounded angles, bright green.

Sepals: dorsal sepal united to the lateral sepals for nearly ¾ inch, forming a wide gibbous tube, free portion ¾ inch long, ovate, 3-nerved, ochre-yellow spotted with brown on the inner surface, tapering into a slender tail about 2¼ inches long, orange, greenish at the back; lateral sepals cohering for about 2 inches, oblong, stiffly reflexed, with 3 nerves, two of which bifurcate, brownish-yellow, deepening to mahogany brown in the centre, shining as if varnished, tapering into slender tails about 1¼ inch long, orange, greenish at the back.

Petals about ½ inch long, linear at the base, then oblong, angled on the anterior margin, apiculate, pale yellow tinged with green.

Lip ½ inch long, broadly oblong near the base, and united to the curved foot of the column by a very flexible hinge, the apex and anterior margins much reflexed, dark purple, covered with small rough papillæ, the central line greenish.

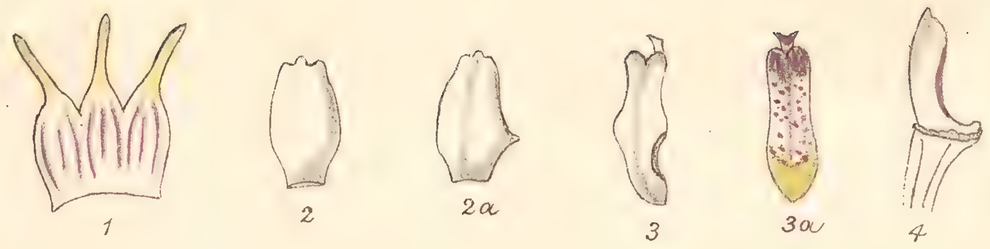
Column about ⅜ inch long, curved, broadly winged, pale green, the foot spotted with crimson, apex crenate.

THIS handsome and curious species was discovered in 1874 by the Belgian collector, Patin, who sent specimens to Mr. B. S. Williams without recording its habitat. The first plants which flowered in cultivation were imported for Mr. Bull by Shuttleworth, who found it in abundance near Ocaña, in the Province of Santander, Colombia. The species most resembling *M. velifera* are *M. elephanticeps*, *M. Mooreana* and *M. Peristeria*, especially in the rigid substantial texture of the flowers, the shape of the tube, and the prominence of the nerves upon the outer surface. None of these, however, show the peculiar shining brown colour of the lateral sepals so remarkable in *M. velifera*.

The name *velifera* signifies "sail-bearer," but Professor Reichenbach's reason for choosing it is scarcely apparent. The plant is still rare in cultivation, and I am indebted to friends for specimens.

Explanation of Plate:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, base of lip *(much enlarged)*;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.



J. Barbosa Rodriguez del. 1885.
Florence H. Woolward lith. 1893.

M & N. Hanhart imp.

MASDEVALLIA YAUAPERYENSIS *Rodrig.*

MASDEVALLIA YAUAPERYENSIS Rodrig.

MASDEVALLIA YAUAPERYENSIS Rodrig. Vellosia vol. I. (1891), p. 121.

Leaf 4 inches long, linear-oblong, narrowing below into a slender grooved petiole, dull green.

Peduncle, including the very short pedicel, about 3½ inches long, terete, very slender, ascending from the base of the petiole, dark green ; bract ¼ inch long, ovate, apiculate, sheathing below, pale green.

Sepals cohering for ⅜ inch, forming a campanulate tube, free portions very short, triangular, pure white, each with three crimson streaks, greenish at the base, tapering into flattened yellow tails ¼ inch long.

Petals oblong-oval, angled on the anterior margin, white, apex obtusely tridenticulate.

Lip a little longer than the petals, oblong, with two lateral lobes, grooved in the centre, white, spotted with crimson especially at the base, apex recurved, yellow.

Column equalling the petals, white, narrowly winged with crimson.

THE river Yauapery, in Brazil, from which this little plant receives its name, is a tributary of the Rio Negro, running southward for nearly two hundred miles, and joining the Rio Negro at about 2° S. lat. by 62° W. long. The low banks, composed of alluvium deposited by frequent floods, are covered with rank creeping vegetation, the loose soil bound together by the roots of coarse grasses, and forming only at some distance from the river a sufficient foundation for the growth of shrubs and low trees, the outskirts of the dense forests which cover the surrounding country. Most of the trees are thickly entangled with mosses and flowering creepers, hiding trunks and branches, often killing the trees themselves, and forming immense masses of flowers and foliage exquisitely varied in form and colouring. In very damp shady places upon the eastern bank of the river, *Masdevallia Yauaperyensis* was discovered by Senhor Barbosa Rodriguez, growing among the mosses a few inches from the ground upon the trunks of trees and especially upon the stems of lianas, or hanging in tufts by its clinging roots, and flowering from January to March.

Senhor Rodriguez, the first explorer of the river Yauapery, was commissioned in 1884 by the Governor of Amazonas to undertake the subjugation of a tribe of Indians named Krichanas, living upon the banks of the river and for many years the terror and scourge of peaceful settlers. During two years he lived among them, frequently in danger of his life, penetrating almost to the source of the river and collecting valuable specimens along both banks. By his courage and wise judgment he gained the confidence of the Indians, inducing them to give up their wild forest life, and leaving them comparatively civilised, and friendly towards the agricultural and fishing population of the banks of the Rio Negro.

The temperature of the habitat of *M. Yauaperyensis* is 26° to 27° Centigrade (about 78° to 84° Fahrenheit), and the elevation is 60 mètres (195 feet) above the level of the sea. The discovery of this plant so far inland, almost in the heart of South America, in the low alluvial region of the bed of the Amazon, throws a new light upon the geographical distribution of Masdevallias, hitherto considered to be a genus of mountain plants, chiefly restricted to a high elevation and a cool temperature in the mountains of Central and South America.

For the accompanying drawing, as well as for the above information, I am indebted to Senhor Rodriguez, who, by his letters, and by forwarding to me a copy of his interesting work "Vellosia, Contribuições do Museu Botanico do Amazonas," has done his utmost to render me assistance. His original description of the plant is as follows :

"*Caule secundario nullo; folio oblanceolato, erecto, subacuto; scapo folio longitudine; sepalis connatis, cupuliformibus, cum aristis longe-productis, recurvis; petalis carnosis, antice canaliculatis, postice convexis, unidentatis in marginibus externis, apice truncatis, apiculatis; labello recurvo, unguiculato, sulcato, lateraliter in medium bicalloso; gynostemio erecto, mentoso.*"

Explanation of Plate :

Fig. 1, sepals detached and spread out, *natural size ;*—2, petal ;—2a, inner side of petal ;—3, lip, side view ;—3a, lip, front view ;—4, column ; *all enlarged.*

SECTION IV.

CUCULLATÆ Rchb. f.

THE plants of this Section are distinguished by the extreme shortness of the pedicel, which causes the large cucullate bract to conceal the ovary and the base of the flower. All the known species are in cultivation.

3 species figured :

Masdevallia corniculata Rchb. f.
cucullata Lindl.
macrura Rchb f.

(Also *M. calyptrata* Kränzl. (*errore eclyptrata*) Gard. Chron. 1895, pt. II., p. 577. A new species not figured in this work. Fl. Berlin 1895. Orange and brick-red. Hab. incog.)

Florence H. Woolward del. et lith 1890.

Hanhart imp.

MASDEVALLIA CORNICULATA *Rchb.f.*

MASDEVALLIA CORNICULATA Rchb. f.

MASDEVALLIA CORNICULATA Rchb. f. Gard. Chron. 1878, pt. I., p. 72; 1881, pt. II., p. 236; Veitch Manual Orch. pt. V. (1889), p. 37.

Var. inflata, Veitch Manual Orch. pt. V. (1889), p. 37;=*Masdevallia inflata* Rchb. f. Gard. Chron. 1881, pt. II., p. 716; Orchidophile (Godefroy) 1881, p. 172.

Leaf 8 or 9 inches long, about 1½ inch wide, oblong-lanceolate, carinate, apex tridenticulate, margins reflexed, bright green, narrowing below into a slender, grooved, pale green petiole.

Peduncle 3 or 4 inches long, terete, ascending from a joint near the base of the petiole, pale green; bract very large, concealing the ovary and the base of the perianth, ovate, acuminate, pale green, with a rudimentary bud within at the base.

Ovary about ¼ inch long, triangular, with three crenate wings, bright green, sometimes spotted with crimson.

Sepals: dorsal sepal united to the lateral sepals for about ¾ inch, forming a wide inflated tube, free portion triangular, very short, with three nerves, two of which bifurcate; lateral sepals cohering for about 1¼ inch, oblong-ovate, with three carinate nerves, two of which bifurcate; all bright yellow, spotted with reddish-brown, and terminating in slender yellow tails, 2 or 2½ inches long.

Petals about ¼ inch long, linear-lanceolate, acutely angled on both margins, pale yellow, apex attenuate, prolonged, reflexed, orange-yellow, with numerous small papillæ.

Lip ¼ inch long, united to the curved foot of the column by a very flexible hinge, grooved at the base, with a concave nectary on each side, pandurate, with two short longitudinal wings, pale yellow, with small pink spots, apex rough with minute papillæ, orange-yellow.

Column nearly ¼ inch long, winged, apex slightly crenate, white, spotted on the foot with pink.

MASDEVALLIA CORNICULATA was discovered in 1877 by a collector sent out to Colombia by Messrs. Backhouse, of York, who supplied specimens from their plants for Professor Reichenbach's description in 1878. Consul Lehmann has not yet found this species in its native habitat, and the only information which he can give concerning it is that "it originates from the higher regions of the Andes, at an elevation of 2,500 to 3,000 mètres" (8,125 to 9,760 feet). The specimen represented in the accompanying Plate affords an excellent example of the long, horn-shaped petals, which suggested the very appropriate name of "*corniculata.*"

In the year 1881 a variety of *M. corniculata*, imported from Colombia, appeared in the collection of Mr. Bull, and was at first named by Professor Reichenbach as a distinct species, *M. inflata.* It has not been thought necessary to give a drawing of this variety,

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Explanation of Plate, drawn from a Plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, base of lip, showing nectaries *(much enlarged)*;—4, column;—4a, apex of column, *all enlarged*;—5, apex and section of leaf, *natural size.*

a rarer plant in cultivation than the type, from which it differs chiefly in being of a paler, clearer shade of yellow, and scarcely spotted, the internal structure being identical. One specimen, kindly sent to me by Mr. F. W. Moore, from the Royal Botanic Gardens at Glasnevin, showed when fresh, very faintly coloured spots upon the outer surface, similar in size and colour to those of the usual well-known form.

The original collectors of these two interesting plants appear to have sent home no field-notes as to locality or elevation, and it is to be regretted that no detailed information can be given. Consul Lehmann, however, suspects the existence of *M. corniculata* among the mountains of Antioquia, in a locality which he proposes to visit shortly, and it is hoped, therefore, that our present scanty knowledge may be added to at no very remote date.

32

Florence H. Woodward. del. et lith. 1890.

Hanhart imp.

MASDEVALLIA CUCULLATA *Lindl.*

MASDEVALLIA CUCULLATA Lindl.

MASDEVALLIA CUCULLATA Lindl. Orch. Lindl. p. 4 (1846) ; Gard. Chron. 1878, pt. I., p. 72 *(under M. corniculata)* ; 1883, pt. I., p. 592 ; 1886, pt. II., p. 747 ; Orchidophile (Godefroy) 1883, p. 660 ; Veitch Manual Orch. pt. V. (1889), p. 38.

Leaf 9 or 10 inches long, oblong-lanceolate, carinate, apex tridenticulate, margins often recurved, bright green, narrowing below into a slender grooved petiole, pale green, sheathed at the base.

Peduncle 4 or 5 inches long, ascending from a joint about an inch above the base of the petiole, terete, slender, with two or three bracts, pale green ; flowering bract about 1 inch long, entirely concealing the ovary and the base of the perianth, ovate, acuminate, with a rudimentary bud within at the base, pale green, sometimes spotted with crimson.

Ovary about $\frac{3}{8}$ inch long, triangular, with crenate wings and six deep grooves, very pale green.

Sepals : dorsal sepal united to the lateral sepals for about $\frac{3}{4}$ inch, forming a wide tube, gibbous beneath, pale green, and having within at the base a rounded shining excrescence, dark crimson, free portion $\frac{3}{8}$ inch long, triangular, with three nerves, two of which bifurcate near the base ; lateral sepals cohering for $\frac{1}{2}$ inch, free portions $\frac{3}{4}$ inch long, ovate-triangular, with three nerves, two of which bifurcate near the base, all claret-crimson, and tapering into very slender tails $1\frac{1}{2}$ or 2 inches long, dark crimson, greenish at the back.

Petals about $\frac{1}{4}$ inch long, linear-oblong, angled on both margins, white, apex obtuse, reflexed, angled, and covered on the inner surface with crimson papillæ.

Lip $\frac{1}{4}$ inch long, oblong, grooved down the centre, with a small nectary on each side at the base, and two longitudinal keels on the anterior portion, crimson, paler in the centre, apex reflexed, dark crimson-purple, covered with small papillæ.

Column $\frac{1}{4}$ inch long, narrowly winged, apex entire, white, the foot and inner surface bright crimson.

THIS species was first described in 1846 by Dr. Lindley, who quotes the field-note of Mons. Linden, its discoverer, as follows : "An epiphyte from the thick forests of Fusagasuga, in the province of Bogotá, at the height of 7,200 feet."

Although discovered as long ago as 1842, *M. cucullata* was not known in cultivation until 1883, when living plants were brought home by Mr. Carder, and first flowered in the collection of Mr. Shuttleworth. It has an extensive geographical distribution, having been found by numerous collectors in different Departments of the Republic of Colombia. Consul Lehmann, in the following note, gives several localities in which he has himself found the plant :

Explanation of Plate, drawn from a Plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, petal, side ;—3, lip ;—3a, base of lip, showing nectaries *(much enlarged)* ;—4, column ;—4a, apex of column ; *all enlarged* ; 5, apex and section of leaf, *natural size*.

Masdevallia cucullata comes from Colombia, where it is very irregularly distributed over a large area. I have observed it in the following localities:—in the Eastern Andes of Bogotá, on the western slopes of the Alto de las Oséras in the Department of Tolima, and from here northwards on the western declivities of the Páramos de Sumapaz, Andabobo, Santa-Rosa and Sibaté in the Department of Cundinamarca. On the highlands of Antioquia, near the town of El Retiro and on the Alto de San Miguel. In the Western Andes of Popayán, upon the eastern slopes of the Cerro Munchique. In the Eastern Andes of Pasto, on the descent from the Páramo del Bordoncillo into the valley of Sebondoy, and also in the vicinity of the village of Putumayu, I observed, in the year 1880, a *Masdevallia* which, although not in flower, appeared to be identical in all its characteristics with *M. cucullata*. The plants were extremely well developed.

Masdevallia cucullata grows in dense and very damp woods, on the trunks of trees near the ground, and also upon the ground itself where deep layers of decayed leaves have accumulated. The elevation of the localities in which it occurs varies from 2,000 to 2,600 mètres (6,500 to 8,450 feet), with a temperature of 13° to 16°.5 Centigrade (about 55° to 62° Fahrenheit). The climate is remarkable for heavy and constant rains, and an atmosphere highly charged with moisture throughout the year. A really dry season, during which all rain ceases, never occurs in those regions. In most localities *M. cucullata* flowers during the months of October and November, but in the Bogotá districts the flowers develope in January and February. Although seed-capsules are very commonly met with, *M. cucullata* is not an abundant species.

F. C. Lehmann.

MASDEVALLIA MACRURA *Rchb. f.*

Florence H. Woolward del. et lith. 1889.

Hanhart imp.

MASDEVALLIA MACRURA Rchb. f.

Masdevallia Macrura Rchb. f. Gard. Chron. 1874, pt. I., p. 240 ; 1877, pt. I., p. 12, fig. 2 ; 1881, pt. II., p. 136, fig. 65 ; Linnæa, XLI. (1877), p. 11 ; De Puydt, Les Orchidées, p. 100 ; Orchidophile (Godefroy), 1883, p. 642 ; Lindenia, vol. III. (1887), t. 113.

Leaf 10 or 12 inches long, 2 or $2\frac{1}{2}$ inches wide, oblong, carinate, obtusely tridenticulate, erect, bright green, narrowing below into a slender petiole, deeply grooved, pale green, with large membranous sheaths at the base.

Peduncle 9 or 10 inches long, terete, ascending from a joint at the base of the petiole, with one or two sheathing bracts, pale green ; flowering bract $\frac{3}{4}$ inch long, 5-nerved, apiculate, sheathing below, entirely covering the ovary, often with a small bud within at the base, pale green.

Ovary about $\frac{3}{8}$ inch long, terete, with six indistinct grooves, pale green, sometimes spotted with brown.

Sepals : dorsal sepal united to the lateral sepals for about $\frac{1}{2}$ inch, forming a wide tube, oblong-ovate, 7-nerved, whitish at the base, then orange-yellow, shaded and spotted with reddish-crimson ; lateral sepals cohering for nearly 1 inch, oblong-ovate, with four strongly carinate nerves, three of which bifurcate, dotted with blackish-crimson papillæ, orange-yellow deeply shaded with crimson, all tapering into slender flattened yellow tails about 4 inches long.

Petals about $\frac{3}{8}$ inch long, oblong, curved, fleshy, anterior margin much thickened, posterior margin acutely angled, apex very obtuse, bright yellow with brown spots.

Lip $\frac{1}{4}$ inch long, oblong, fleshy, with two deep nectaries near the base, and two longitudinal keels, yellow spotted with dark crimson, apex reflexed, much thickened, orange-yellow with a few dark spots, rough with papillæ arranged in three obscure lines.

Column about $\frac{1}{4}$ inch long, winged, apex entire or slightly crenate, yellow, closely spotted on the foot with crimson.

MASDEVALLIA MACRURA was discovered in 1871 by Roezl, near Sonson, in the province of Antioquia, and was described in 1874 by Professor Reichenbach from dried specimens. The first living plants were imported in 1876 by Mr. Shuttleworth, and first flowered in the collection of Mr. Bull in 1877. In the Gardeners' Chronicle, 1877, pt. I., p. 12, Professor Reichenbach states that a short-tailed variety was collected by Patin, a Belgian traveller ; and a gigantic variety is mentioned by Roezl in the following account of the town of Sonson, taken from Godefroy's "Orchidophile," 1883, p. 642, from which we learn that Sonson is a little town of 4—5,000 inhabitants, situated in the State of Antioquia, on a small tributary of the Rio Cauca, on the boundary, and a little to the north of, the State of the same name. This town deserves to be called the city of Masdevallias, for Roezl found there, on the roof of one house, as many as four species of this genus, growing with extraordinary vigour ; and in the neighbourhood of the town more than twenty-five species besides, growing at altitudes varying from 2,000 to 2,500 mètres (6,500 to 8,125 feet). Roezl adds that the local name for *M. macrura* is

"La Viuda,"—"The Widow"; but, according to Wallis, this name is given to *M. cucullata*, a much darker flower. In 1871, *M. macrura* was so abundant in this locality, and the native children collected it for Roezl in such quantities, that he was obliged to abandon more than a thousand plants. The plant grows most commonly upon great blocks of granite, scattered over the ground, and thickly covered with moss. Rain is very frequent, and almost every morning the fog is intensely thick, with a temperature, according to Roezl's account, of five or six degrees below zero Centigrade, or nine to eleven degrees of frost Fahrenheit. Consul Lehmann, however, informs me that this statement is erroneous, and that the lowest temperature registered in the neighbourhood of Sonson is only 31° or 30° Fahrenheit, or one or two degrees of frost.

Roezl once received, among a number of plants of *M. macrura*, a specimen of gigantic size, the leaves measuring two feet long by four inches wide, and very thick. The only flower upon the plant was also of unusual dimensions, measuring nearly twelve inches across. It must be presumed that this measurement was from tip to tip of the extended tails. Owing to the faded condition of this flower, Roezl could not decide whether it was a distinct species or only a variety of *M. macrura*, which it appeared to resemble exactly in shape and colour. Even by offering a large reward to the young inhabitants of Sonson, he never succeeded in obtaining another specimen of it.

Masdevallia ellipes, M. erinacea, M. molossus, M. saltatrix, M. Benedicti, M. Roezli, and other species, were found by Roezl growing in the neighbourhood of Sonson under exactly the same conditions as *M. macrura.*

Consul Lehmann adds the following information :

Masdevallia macrura grows on trees, or sometimes on the ground among copse or brushwood, in dense and damp woods, on the Alto de San Miguel and above Envigado, in the department of Antioquia, at an elevation of 2,300 to 2,600 mètres (7,475 to 8,450 feet). It has been also observed near Sonson and other parts of Antioquia. This species flowers in October and November in its natural habitat.

The annual average temperature of the region ranges between 14 and 15 degrees Centigrade (57° and 59° Fahrenheit). There are two rainy and two dry seasons during the year ; the first rainy season lasting from the end of March until the end of June ; the second from the end of September until December. The hygrometric average is between 69° and 70° per cent. during the dry months, and 76°—78° per cent. during the wet ones.

F. C. Lehmann.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, lip, petal, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, back of base of lip, showing nectaries, *much enlarged ;*—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size.*

SECTION V.

FISSÆ Rchb. f.

ONLY one species of this Section is in cultivation, and I can ascertain the names of but two others. Consul Lehmann has, in his Herbarium, a few specimens of allied plants—unnamed. The dorsal sepal is not united to the lateral sepals, and this peculiarity suggested Reichenbach's name for the group, *Fissæ*, or *cleft*.

1 species figured:

Masdevallia picturata Rchb. f. (=*M. meleagris Rchb. f.*)

Not in cultivation:

M. falcago Rchb. f. Otia Bot. Hamb. (1878), p. 16.
uncifera Rchb. f. Otia Bot. Hamb. (1878), p. 16.

Florence H Woolward del et lith 1891

MASDEVALLIA PICTURATA *Rchb f.*

Hanhart imp

MASDEVALLIA PICTURATA Rchb. f.

MASDEVALLIA PICTURATA Rchb. f. Xen. Orch. I. (1858), p. 198, pl. 75, fig. 1 *(as M. meleagris)*; Otia Bot. Hamb. p. 16 (1878); Orchidophile (Godefroy), vol. I. (1881), p. 193; Gard. Chron. 1882, pt. I., p. 10; Trans. Linn. Soc., vol. II., pt. 13, p. 281, Bot. Roraima Exped. 1884, E. F. im. Thurn.

M. meleagris Rchb. f. Xen. Orch. I. (1858), p. 198, pl. 75, fig. 1=*M. picturata* Rchb. f., Otia Bot. Hamb. p. 16 (1878), non. *M. meleagris* Lindl. Ann. nat. hist. vol. XV. (1845), p. 257.

Leaf 2½ inches long, oblong-lanceolate, obtusely tridenticulate, fleshy, narrowing below into a slender grooved petiole sheathed at the base, dull green, the older leaves spotted with dull brown.

Peduncle about 2½ inches long, slender, terete, erect, with one or two sheathing bracts, pale green; flowering bract ⅜ inch long, apiculate, ovate, almost concealing the ovary, pale yellowish-green.

Ovary ⅛ inch long, with six strongly crenate wings, bright green.

Sepals: dorsal sepal entirely free from the lateral sepals, nearly ½ inch long, oval-oblong, 3-nerved, very pale yellow, with numerous velvety crimson spots, terminating in a slender bristle-like tail 1¼ inch long, brownish-crimson; lateral sepals cohering only near the base, about ½ inch long, oblong-ovate, 3-nerved, nerves carinate without, pale yellow, bright orange at the base, spotted with velvety crimson, terminating in slender bristle-like tails 1 inch long, brownish-crimson.

Petals ¼ inch long, ligulate, with a fleshy process within the anterior margin near the base, apex acutely tridenticulate, the central tooth prolonged, pale yellow.

Lip about ⅜ inch long, united by a hinge to the foot of the column, grooved at the base, with two lateral lobes, apex with three rounded lines, orange-yellow, spotted with reddish-brown.

Column nearly ¼ inch long, slender at the base, winged, apex green and crimson.

MASDEVALLIA PICTURATA was discovered in July 1850, by Wagener, near Caracas in Venezuela, at an elevation of 6,000 feet, and was also found at Tovar in 1854 by Fendler. Professor Reichenbach appears at one time to have considered this species to be identical with *M. meleagris* Lindl., for he published in 1858 a drawing of *M. picturata* under that name (Xen. Orch. I. p. 198, pl. 75, fig. 1). Later, however, he explains that he had never seen Lindley's *M. meleagris*, and that the plant represented in his Plate was *M. picturata*, not the true *M. meleagris* of Lindley (Otia Bot. Hamb. 1878, p. 16). The latter plant—of which the original specimen, discovered in 1845 by Hartweg between the Páramo de San Fortunato and Fusagasuga, Bogotá, is preserved in the Royal Herbarium, Kew—is most distinct from *M. picturata*, the leaves being more rounded, on a slender petiole, and the flower-stem nearly five inches in height. The flower is differently shaped, and the dorsal sepal is marked with narrow and regular bands of purple. The strongest point of difference is perhaps the slender wingless ovary, the ovary of *M. picturata* having, as will be seen in the accompanying Plate, fig. 1a, six remarkably waved or crenate wings, a characteristic not present in so great a degree in any other species yet known.

M. picturata is especially interesting in having a very remarkable geographical distribution, of which the extreme limits, as at present known, are: On the south-east

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Explanation of Plate, drawn from a Plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column;—*all enlarged*;—5, apex and section of leaf, *natural size*.

Mount Roraima, on the boundary between British Guiana and Venezuela; on the north the mountains of Caracas; on the south and west Cali and Tolima in the Western and Central Cordilleras of Colombia, and Frontino in Antioquia; and on the north-west Costa Rica.

Specimens from these localities vary greatly in size and depth of colour. Those collected upon the upper slopes of Mount Roraima at an elevation of about 6,000 feet, during the "Roraima Expedition" of 1884-5, flowering in November and December, are less than two inches in height, the colour, as far as can be judged from dried flowers, being much the same as in the plant here figured, while the apex of the leaves is more sharply denticulate, with the central tooth longer than the lateral ones. Some of these dried specimens were sent in 1885 by Mr. Everard im Thurn to the British Museum of Natural History, where Mr. H. N. Ridley, then a member of the Botanical Staff, identified them with *M. picturata* Rchb. f.

On the western slopes of the Western Cordilleras of Colombia exactly similar plants have been found by Consul Lehmann, growing on trees in thick damp forests at an elevation of 5,850 feet, and flowering in April. Larger specimens were also collected by him near Tolima, at an elevation of 6,500 feet, growing on trees and often on dead wood in the damp forests of the upper Rio Cabrera, flowering in January. These plants, although the flowers are of darker colouring—the brown spots being almost suffused over the surface of the sepals—approach most nearly the variety here represented, a plant found near Caracas by Mr. Edward Wallace, of Colchester, in 1855, at an elevation of about 6,000 feet, growing on the stems and lower branches of trees.

Plants from Frontino in Antioquia, also found growing upon forest trees (elevation 2,500 feet), are intermediate between those from Mount Roraima and Cali, and those from Tolima and Caracas, closely resembling plants found in Costa Rica by Shuttleworth in 1883. The largest form seems to be the specimen found by Fendler in Venezuela in 1854, now preserved in the Kew Herbarium.

A nearly allied species, at present un-named, has been found by Consul Lehmann in the mountains of Cauca, growing on trees in rather thick forests above Chapa on the Tambo at an elevation of 6,500 feet. The plant is only about one inch in height, and has white flowers with yellow spots and an orange lip. A single dried specimen of this little plant is preserved in the Boissier Herbarium at Chambésy, Geneva.

There is but little variation in the temperature of the different localities in which *M. picturata* is found, the annual average being from 59° to about 67° Fahrenheit.

Owing to the delicacy of the species, many attempts to import it alive have totally failed. Of four thousand plants collected in 1885 by Mr. Edward Wallace, with which he started on his homeward voyage, only forty reached Europe alive. Messrs. Sander of St. Albans have also succeeded in importing living plants, and the first flowers seen in England were those in their collection described by Professor Reichenbach in 1882, in the Gardeners' Chronicle, pt. I. p. 10.

SECTION VI.

MINUTÆ Rchb. f.

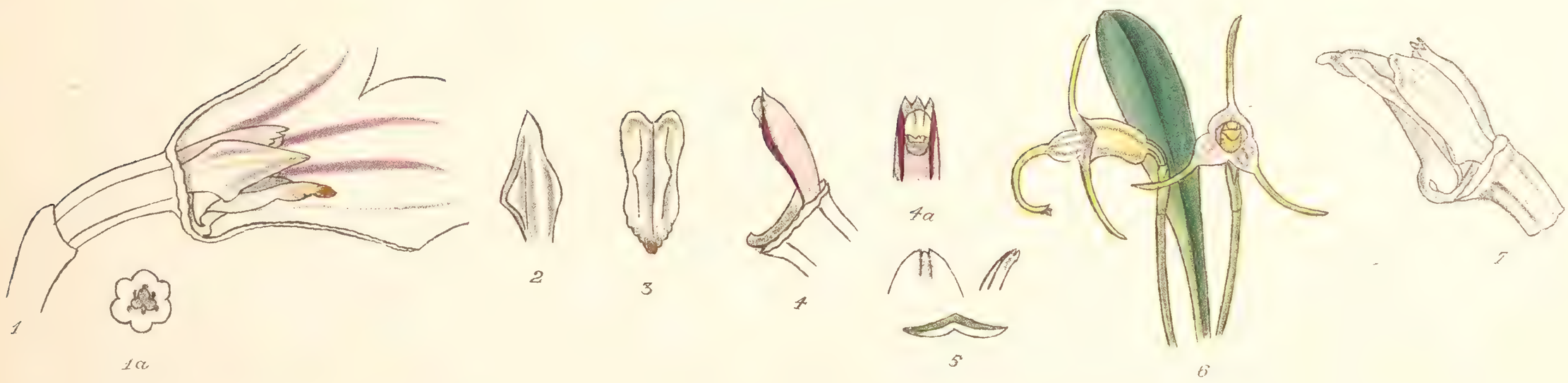
A SOMEWHAT miscellaneous Section, containing small species which cannot correctly be classed in any other group.

4 species figured:

Masdevallia attenuata Rchb. f.
nidifica Rchb. f.
ophioglossa Rchb. f. *(not in cultivation.)*
Wendlandiana Rchb. f.

Not in cultivation:

M. Chontalensis Rchb. f. Otia Bot. Hamb. (1878), p. 17.
flaveola Rchb. f. Gard. Chron. 1884, pt. I., p. 638.
hians Lind et Rchb. f. Bonplandia II. (1854), p. 283.
Lansbergii Rchb. f. Neder Kruidk. Arch. IV. (1859), p. 317.
minuta Rchb. f. Lindl. Ann. Nat. Hist. XII. (1843), p. 396.
ophioglossa Rchb. f. (*see Plate.*)
pumila Poepp. et Endl. Nov. Gen. et Sp. II. (1838), p. 6, t. 108.
pusiola Rchb. f. Gard. Chron. 1887, pt. I., p. 140.



Florence H. Woolward del et lith. 1896.

Gouter, Imp.

MASDEVALLIA ATTENUATA *Rchb. f.*

MASDEVALLIA ATTENUATA Rchb. f.

MASDEVALLIA ATTENUATA Rchb. f. Gard. Chron. 1871, p. 834 ; 1881, pt. II., p. 236 ; Bot. Mag. t. 6273 (1877) ; Godm. et Salv. Biologia Centr. Amer., Bot. Hemsley, vol. III. (1882-1886), p. 207.

Leaf 3 inches long, linear-lanceolate, coriaceous, apex tridenticulate, narrowing below into a slender grooved petiole sheathed at the base, green.

Peduncle about 2 inches long, terete, slender, ascending from the base of the petiole, with two or three sheathing bracts, pale green, tinged with brown ; flowering bract $\frac{1}{4}$ inch long, membranous, apiculate, sheathing below, pale brownish.

Ovary $\frac{3}{16}$ inch long, with six rounded angles, pale green.

Sepals all cohering almost equally, forming a narrow tube, gibbous below, 3-nerved, free portion of the dorsal sepal ovate-triangular, white, with three crimson streaks, and terminating in a slender terete tail nearly $\frac{1}{2}$ inch long ; free portion of lateral sepals oblong-ovate, white, with two crimson streaks, and terminating in slender terete tails $\frac{3}{8}$ inch long ; base of the tube yellow, tails orange, greenish at the back.

Petals a little more than $\frac{1}{8}$ inch long, oblong-lanceolate, with a wide angle on the anterior margin and an angled keel, white.

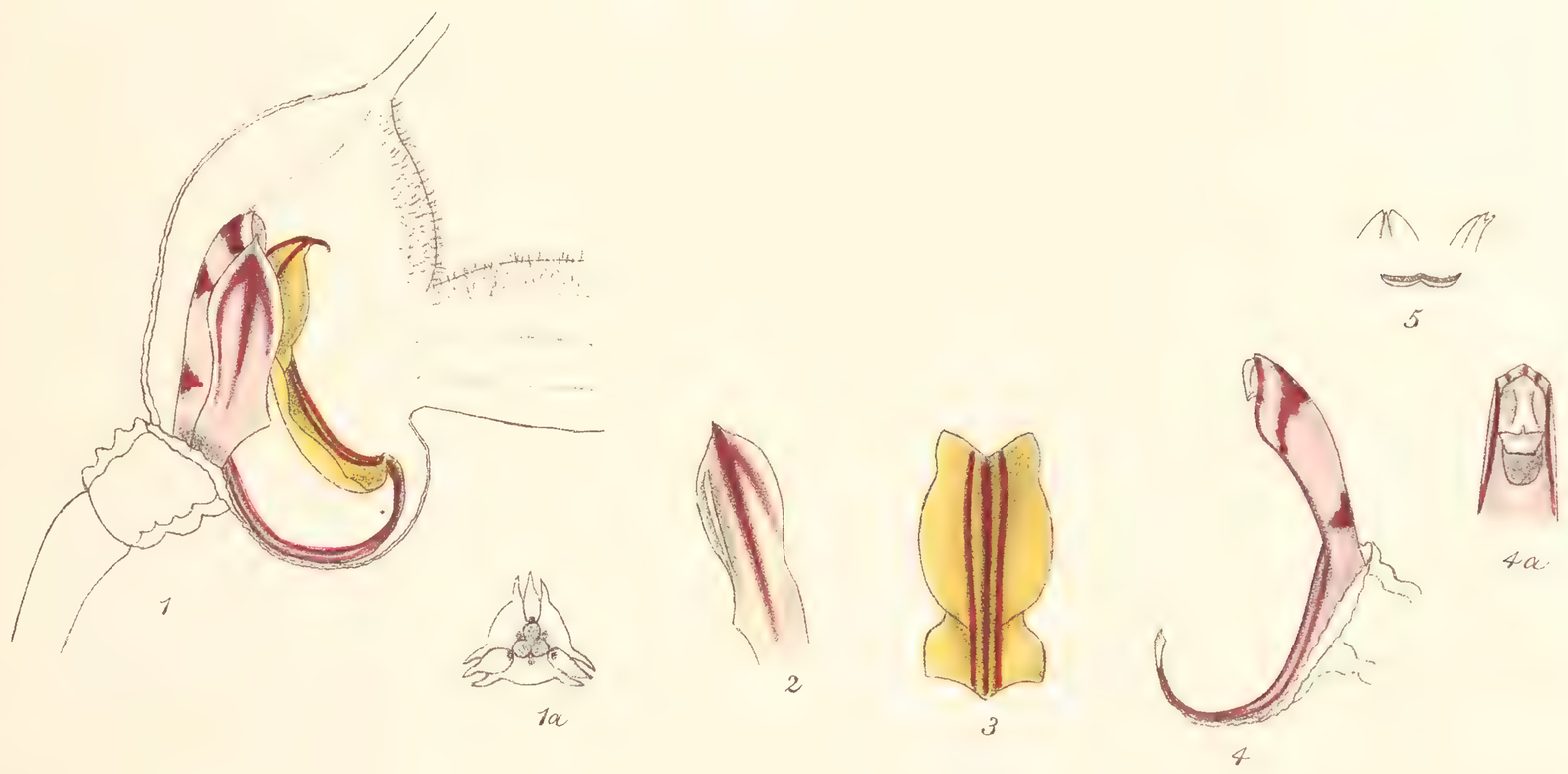
Lip a little longer than the petals, base thickened and united by a hinge to the foot of the column, oblong-cordate, with two longitudinal angled keels, margins crenate, white tinged with pale yellow, apex a minute orange cushion, with crimson dots.

Column shorter than the petals, winged, white and pale pink, broadly edged with crimson, apex denticulate.

IN representing this plant as *Masdevallia attenuata*, it must be confessed that it is not exactly the same as that figured in the Botanical Magazine (t. 6273) under that name, and in order to show the differences between the two, I have reproduced a portion of that Plate at figs. 6 and 7. The flower here shows no crimson streaks, and the shape of the petal (fig. 7) is different, lacking the marginal keel and angle (fig. 2) remarkable in all the specimens which I have examined. The lip in both flowers is much the same in structure, and the two plants can, perhaps, hardly be specifically separated. The form represented in the Botanical Magazine appears to be very rare in cultivation, even if it now exists at all, for, in all the collections of Masdevallias—in this country and on the continent—whose owners have generously placed specimens at my disposal, the plant which I figure is grown as *M. attenuata.* Nowhere have I been able to obtain, or to hear of, flowers similar to those drawn by Mr. Fitch for the Botanical Magazine, in 1877, which are, no doubt, the original form of the species named and described by Reichenbach in 1871. He states that the habitat of *M. attenuata* is Costa Rica, whence it was imported by Messrs. Veitch.

Explanation of Plate :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size* ;—6, flower and leaf copied from t. 6273 of the Botanical Magazine ;—7, petal, lip, and column, copied from fig. 2 of the same Plate.



Florence H. Woolward del. et lith. 1892.

MASDEVALLIA NIDIFICA *Rchb. f.*

M&N. Hanhart imp.

MASDEVALLIA NIDIFICA Rchb. f.

MASDEVALLIA NIDIFICA Rchb. f. Otia Bot. Hamb. (1878), p. 18; Gard. Chron. 1879, pt. II., p. 456; 1881, pt. II., p. 336; 1888, pt. II., p. 628.

Leaf 1½ or 2 inches long, oval-oblong, leathery, apex tridenticulate, narrowing below in a very slender grooved petiole, sheathed at the base.

Peduncle about 1½ inch long, terete, very slender, ascending from within the sheath at the base of the petiole, dull greenish-crimson; flowering bract about $\frac{3}{16}$ inch long, membranous, sheathing, apiculate, pale green.

Ovary $\frac{3}{16}$ inch long, with six crenate wings, pale green spotted with crimson.

Sepals: dorsal sepal united to the lateral sepals for $\frac{3}{16}$ inch, forming a roundly inflated tube, gibbous beneath, 3-nerved, cucullate, rotundate, whitish, almost transparent, with a few small crimson spots on each side and rich crimson nerves, and terminating in a very slender dark crimson tail about $\frac{3}{4}$ inch long; lateral sepals cohering for about $\frac{3}{16}$ inch, 3-nerved, ovate, pale transparent sparkling yellow, with one broad reddish-crimson streak in the centre, and a few minute crimson spots, and terminating in very slender pale yellow tails about $\frac{3}{4}$ inch long; all the sepals covered on the inner surface with microscopic velvety hairs.

Petals $\frac{1}{16}$ inch long, linear-oblong, with a strong keel on the anterior margin, whitish, nearly transparent, streaked with crimson.

Lip a little longer than the petals, pandurate, curved, united to the curved foot of the column by a flexible hinge, yellow, with three central crimson streaks.

Column a little longer than the petals, narrowly winged, whitish or pale pink, marked and edged with crimson, apex entire.

THE first description of *Masdevallia nidifica* was published by Professor Reichenbach in 1878, from dried specimens and a drawing sent to him by Consul Lehmann, who discovered the plant in 1877, in the Cordilleras of Quito, Ecuador. It grows in dense masses on the trunks and branches of trees in damp open woods, flowering profusely during the heaviest rains of February, throughout March and April, and again, even more abundantly, in September, the driest month of the year.

There appear to be many varieties of *M. nidifica*, which differ chiefly in size, some being even smaller than the plant here represented, and others attaining a height of three inches.

The best authority upon the habitat of this species is Consul Lehmann, its discoverer, who says:

Masdevallia nidifica has a very extensive geographical distribution, ranging from Costa Rica, through Colombia and Ecuador, to the north of Peru. Its vertical range is also remarkable, extending from 500 to 2,000 mètres (1,625 to 6,500 feet) above the level of the sea. I know only one other species of *Masdevallia* which, found chiefly in Colombia, extends also into Costa Rica. I have found *M. nidifica* in the following localities:

In Costa Rica:—At La Palma and San Isidro between the two volcanoes of Irazú and Barba, in December 1881.

In Colombia:—At La Bramadora, near Yarumal, and at Frontino, at 1,200 to 1,600 mètres (3,900 to 5,200 feet); at Cajamarca in the western Andes of Roldanillo; on the western slopes of the Cerro

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Explanation of Plate:

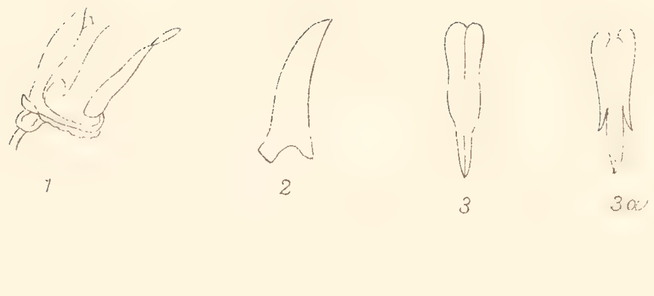
Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

Munchique near Popayán ; and at San Pablo on the road from Barbacoas to Tuquerres, at 1,200 to 1,500 mètres (3,900 to 4,875 feet).

In Ecuador :—At Anque on the way from Quito to Nanegal ; at Cansacoto, Milligallí, and Silante, between the Cerro de Corazón and Santo Domingo de los Colorados, at 1,400 to 2,000 métres (4,550 to 6,500 feet) ; at Balsapamba between Babahoyo and Chimborazo ; at Puente de Chimbo, on the road from Yaguachi to Alansí ; at Chacayacu, on the way from Naranjal to Cuenca ; and at El Cucho between Santa Rosa and Zaruma, at an elevation of 500 to 600 mètres (1,625 to 1,950 feet).

The specimens first named by Reichenbach were collected at Anque and Cansacoto near Quito, at 1,400 to 2,000 mètres, the highest elevation of the species, where plants are often found twice as large as those growing in Costa Rica, the flowers being more substantial, pale yellow, marked with broad dark chocolate-brown streaks on both dorsal and lateral sepals. The lip and petals also differ somewhat from those of flowers growing at the lowest elevation, which are small and membranous, pale yellow, faintly spotted with small reddish dots on the outside of the lateral sepals. Specimens from Costa Rica vary slightly from the Colombian plants, and considerably from those found in Ecuador.

M. nidifica grows on trees and also on walls of rock. The climate is always damp, and as there are but few days without rain during the year, the atmosphere is saturated with moisture.



F.C.Lehmann del.

MASDEVALLIA OPHIOGLOSSA *Rchb. f.*

Hanhart lith et imp.
1894.

MASDEVALLIA OPHIOGLOSSA Rchb. f.

MASDEVALLIA OPHIOGLOSSA Rchb. f. Otia Bot. Hamb. (1878), p. 17.

Leaf nearly 2 inches long, oblong-lanceolate, apex tridenticulate, bright green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle about $2\frac{1}{2}$ inches long, terete, slender, pale green, ascending from the sheath at the base of the petiole ; bract $\frac{3}{16}$ inch long, apiculate, sheathing the base of the ovary, pale brownish-green.

Ovary very minute, with six crenate keels, pale green.

Sepals cohering for nearly $\frac{3}{8}$ inch, forming a narrow tube, gibbous below, free portion very minute, triangular, white, pale yellow at the base, terminating in slender pale yellow tails about $\frac{1}{2}$ inch long.

Petals very minute, linear-lanceolate, angled on the anterior margin, white.

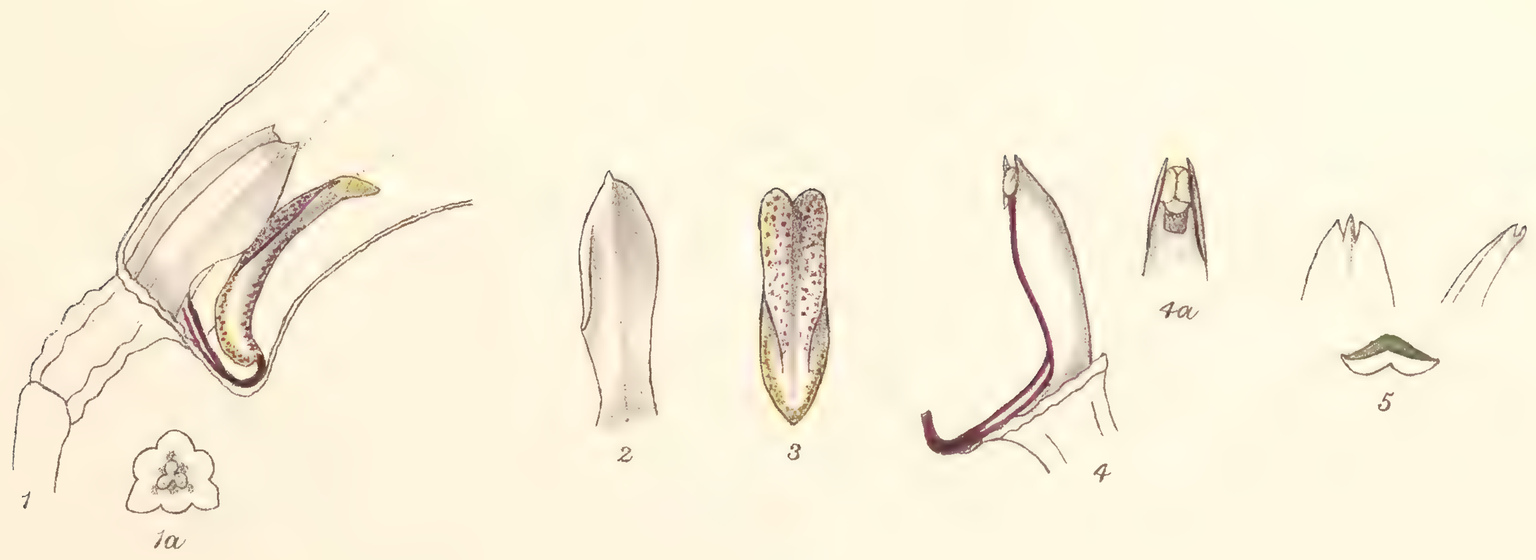
Lip a little longer than the petals, united by a hinge to the curved foot of the column, cordate-oblong, narrowed towards the apex, with two pointed lateral lobes, white.

" *Columna clavata*," Rchb. f.

MASDEVALLIA OPHIOGLOSSA was discovered in 1877, on the Western Andes of Quito, by Consul Lehmann, who sent dried specimens to Professor Reichenbach to be named and described. This species has never been in cultivation, nor has any drawing of it hitherto been published, and we are indebted to Mr. Lehmann for the accompanying Plate, as well as for information respecting its habitat. He found the plant in Ecuador, growing on steep walls of volcanic rock in thick damp woods near Quito, and also near Silante and Canzacoto on the western slopes of the Cerro del Corazón, at an elevation of 1,800 to 2,100 mètres (5,850 to 6,825 feet). It is not an uncommon plant, and flowers from the middle of January to the end of March, sometimes in great profusion. In the Boissier Herbarium there are fine specimens found in the same locality by Consul Lehmann, and named by him *var. maxima.*

The species most nearly allied to *M. ophioglossa* are *M. Wendlandiana* and *M. pumila,* of which the latter is not at present in cultivation.

Explanation of Plate, from a drawing by Consul Lehmann :
Fig. 1, petal, lip, and column ;—2, petal ;—3, lip ;—3a, back of lip ; *all much enlarged.*



Florence H. Woolward del. et lith. 1894.

Hanhart imp.

MASDEVALLIA WENDLANDIANA. *Rchb. f.*

MASDEVALLIA WENDLANDIANA Rchb. f.

Masdevallia Wendlandiana Rchb. f. Gard. Chron. 1887, pt. I., p. 174 ; 1888, pt. I., p. 563 ; 1889, pt. I., p. 587 ; Orchidophile (Godefroy) 1888, p. 259 ; Veitch Manual Orch. pt. V. (1889), p. 72.

Leaf about 2 inches long, linear, coriaceous, apex tridenticulate, bright green, narrowing below into a grooved petiole sheathed at the base.

Peduncle a little longer than the leaves, very slender, terete, with two sheathing bracts, very pale green, ascending from within the sheath at the base of the petiole ; flowering bract $\frac{1}{4}$ inch long, membranous, apiculate, sheathing below, pale brownish-green.

Ovary nearly $\frac{1}{8}$ inch long, with six grooves, pale green.

Sepals : dorsal sepal united to the lateral sepals for about $\frac{1}{4}$ inch, forming a narrow tube, gibbous below, free portion oblong-triangular, 3-nerved, narrowing into a flattened tail nearly $\frac{3}{8}$ inch long ; lateral sepals cohering for about $\frac{1}{4}$ inch, free portion triangular, very minute, 3-nerved, tapering into flattened tails nearly $\frac{1}{4}$ inch long, white, streaked below with rose-purple, tails tipped with pale yellow.

Petals a little more than $\frac{1}{8}$ inch long, oblong, apiculate, slightly thickened and angled on the anterior margin, white.

Lip a little longer than the petals, oblong, grooved, united to the foot of the column by a flexible hinge, with two longitudinal keels near the centre, dull white, semi-transparent, with minute crimson spots, apex yellow spotted with crimson.

Column not quite so long as the petals, white, margined with crimson, apex denticulate, foot crimson.

MASDEVALLIA WENDLANDIANA was imported by Mr. F. Sander from Frontino, in Antioquia, and was first described by Professor Reichenbach in 1887. I have no information as to the elevation or temperature of its habitat, but in cultivation it is found to require greater heat than most Masdevallias, with an equal amount of moisture. It appears to be very nearly allied to *M. pumila*, *M. tubulosa*, and *M. minuta*, and may ultimately prove to be identical with at least one of these species.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ;—5, apex and section of leaf, *all enlarged*.

SECTION VII.

MUSCOSÆ.

MOST, if not all, of the species grouped by Reichenbach with *M. muscosa* are now formed into a new Genus (*Scaphosepalum* Rolfe.), and I can ascertain none which can be classed with it. Until, therefore, further discoveries have been made with regard to these rather obscure plants, no final decision as to their Section can be arrived at.

1 species figured :

Masdevallia muscosa Rchb. f.

Florence.H.Woolward del et lith.1894.

Hanhart imp.

MASDEVALLIA MUSCOSA *Rchb.f.*

MASDEVALLIA MUSCOSA Rchb. f.

MASDEVALLIA MUSCOSA Rchb. f. Gard. Chron. 1875, pt. I., p. 460; 1881, pt. II., p. 336; 1887, pt. I., p. 836; pt. II., p. 522; Ann. Bot. vol. I. (1887-8), p. 237, pl. XII.; Veitch Manual Orch. pt. V. (1889), p. 54.

Leaf about 2 inches long, oval-oblong, very leathery, tridenticulate, narrowing below into a slender grooved petiole, sheathed at the base, dull green tinged with purple, the upper surface covered with minute rounded papillæ.

Peduncle 4 or 5 inches long, terete, ascending from within the sheath at the base of the petiole, bearing several flowers in succession, with two or three closely sheathing brownish bracts, pale green covered with long mossy hairs, having each a minute viscid tip; flowering bract $\frac{3}{16}$ inch long, membranous, pale brown.

Ovary $\frac{1}{4}$ inch long, with six rounded angles, greenish, covered with short stiff hairs, the short terete pedicel being smooth.

Sepals: dorsal sepal united to the lateral sepals for $\frac{3}{16}$ inch, forming an open tube, gibbous below, free portion triangular-oblong for $\frac{3}{16}$ inch, 3-nerved, terminating in a slender reflexed tail about $\frac{3}{4}$ inch long, clubbed at the tip; lateral sepals cohering for $\frac{1}{4}$ inch, triangular-oblong for $\frac{1}{4}$ inch, 3-nerved, terminating in slender reflexed tails about 1 inch long, clubbed at the tip; all pale yellow with darker yellow tails.

Petals nearly $\frac{1}{4}$ inch long, linear, with an angle on the upper margin near the base, apex rounded and thickened, curving forward so as to meet in front of the column, yellow, with a red-brown central streak.

Lip about $\frac{1}{4}$ inch long, united to the curved foot of the column by a very flexible hinge, linear at the base, with a rounded central ridge or cushion, then widening into a shell-like blade, velvety within, the margins incurved and set with long stiff hairs, the apex a small rounded lobe; pale yellow, the central ridge orange with red spots, the blade half yellow, half maroon-purple.

Column much shorter than the petals, winged, the anthers pointing backwards and downwards, pale green, apex brown.

THIS curious plant was discovered near San Domingo, by Shuttleworth, when collecting for Mr. Bull in the Central Cordillera of Tolima, Colombia. The covering of mossy hairs upon the stem, peculiar to the species, suggested to Professor Reichenbach the name *muscosa*, or *mossy*, and is probably intended to prevent crawling insects from making their way up the stem to reach the flower. A still more remarkable characteristic is the sensitive lip, which closes upon the curved petals when the central part is touched, imprisoning any insect alighting upon it, and holding it forcibly as in a trap. There is no contrivance for destroying intrusive insects and retaining them as nourishment for any part of the plant, and they can only be intended to escape and carry away the anthers from one flower to another. The incurved margins of the lip are edged with stiff sharp hairs, effectually guarding the egress in that direction, and a fly, in attempting

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Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, showing the lip closed;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column;—4b, column with the anthers removed; *all enlarged;*—5, apex and section of leaf, *natural size.*

to escape from its prison, would more easily force its way out from the upper side, probably dislodging the anthers in its struggles. The same fly, with the anthers adhering to it, alighting upon the lip of a second flower and again imprisoned, must, by its movements, bring the anthers in contact with the viscid stigmatic surface, to which some portion of the pollen-grains would attach themselves. The lip closes of itself at dusk and opens again in the morning, showing that the insect designed for the fertilisation of the flower is a diurnal one. When the lip has been made to close by a light touch upon the sensitive portion—the bright yellow central ridge—it remains closed for twenty or thirty minutes, unless forcibly opened and held down; after that period it gently re-opens.

It should be noticed that the anthers are inserted upon the apex of the column the reverse way to that of all known species of *Masdevallia*, the pollinia pointing backwards and downwards, so that the rostellum is the most prominent point of the column.

The sensitive nature of the lip was first remarked by Mr. Bean, of the Orchid department in the Royal Gardens, Kew. It is well described in the "Gardeners' Chronicle" for June 25th, 1887, and still better by Professor Oliver—with excellent drawings—in the "Annals of Botany" vol. I. (1887), p. 237.

The upper surface of the leaves is covered with small rounded papillæ, but for what purpose these are intended it is difficult to say.

Details of the habitat of *M. muscosa* are given by Mr. Lehmann as follows :

This species has a very wide and irregular geographical distribution throughout Ecuador and Colombia, extending fully six hundred miles from north to south, and ranging vertically from 1,800 to 2,300 mètres (5,850 to 7,475 feet), in a temperature varying from 15° to 17°.5 Centigrade (59° to 62°.6 Fahrenheit). Wherever it is found the atmosphere is uniformly damp during the whole year. It grows most frequently upon the trunks and thick branches of trees in mountain forests, where the absence of underwood allows a perpetual circulation of air. The scarcity of such woods accounts for the rarity of the plant, for although found in so many localities it is nowhere common. In many parts of Ecuador it also grows upon volcanic rocks and walls of lava, and produces the largest and most brightly coloured flowers, the flowering season being in February and March.

In Ecuador it is chiefly found in the Andes of Quito, on the banks of the Rio Silante, about Milligallé and Canzacoto on the western slopes of the Cerro del Corazon, and on the road from Calacalí to Nanegal on the Cerro Pululagua.

In Colombia, northwards from the volcano of Pasto at the head of the valleys of the Patia, Cauca, and Magdalena rivers, it occurs almost uninterruptedly as far north as Santa Rosa de Osos, the Yarumal, Carolina and Amalfi, in the north of Antioquia. In the west of Antioquia it is met with in a few localities on the western slopes of the Cordillera at Abriaqui; further south, around Popayán, it is found on the eastern slopes of the Cerro Munchique, near the volcano of Sotará, the mountains of Caldono and Quilichao, about Tacuayó in the central Cordillera, and in other places too numerous to mention.

In Colombia *M. muscosa* flowers from September to December, and in spite of its extensive geographical distribution, shows little variation either in size or colour.

SECTION VIII.

POLYANTHÆ Rchb. f.

MOST of the plants included in this Section, of which the greater number are known only by name, produce more than one flower upon each stem, the flowers of some species expanding at the same time, as in *M. Schlimii*, and of others in succession, as in *M. infracta*. In all the cultivated species, with the exception of *M. Schlimii*, the stem is triquetrous, or three-angled.

M. Forgetiana, lately described by Dr. Kränzlin as a distinct species, is a beautiful yellow variety of *M. infracta*, and is found in the same habitat, the Organ Mountains, in the south of Brazil, not in the north, as stated in Dr. Kränzlin's account of the plant. I received flowers from the Royal Botanic Gardens at Glasnevin, Dublin, in April, 1896, unfortunately too late to be included in my Plate of *M. infracta*.

M. melanoxantha Rchb. f. Bonplandia II. (1854), p. 283; III. (1855), p. 69; Walp. Ann. VI. (1861), p. 190; Gard. Chron. 1875, pt. II., p. 580; 1881, pt. II., p. 336; 1895, pt. I., p. 359, fig. 46.—A rare species, which, although known by name for many years, has seldom flowered in cultivation, and is not available for figuring in this work. The flowers are yellow and dark brown, and are represented in a woodcut in the "Gardeners' Chronicle" for March 23rd, 1895, p. 359, from a plant in Mr. Sander's collection at St. Albans. *M. Mooreana*, a very different species (see Section III. *Coriaceæ*.), is often exhibited under the name of *M. melanoxantha*, and there is frequent confusion between the two plants. The specimens first described by Reichenbach in 1854, were collected by Louis Schlim, at Aspasica, near Ocaña, at an elevation of 5,000 feet.

9 species figured :

Masdevallia aristata Rodrig. *(not in cultivation.)*
auropurpurea Rchb. f.
curtipes Rodrig. *(not in cultivation.)*
Ephippium Rchb. f. (=*M. Trochilus Lind. et M. Colibri, hort.*)
guttulata Rchb. f.
infracta Lindl. (=*M. longicaudata Lemaire et M. albida Pinel.*)
maculata Klotzsch (=*M. bicolor Poepp. et Endl.*)
Schlimii Lind.
Tovarensis Rchb. f. (=*M. candida Klotzsch et Karst.*)

Not in cultivation :

M. aristata Rodrig. *(see Plate.)*
aurantiaca Lindl. Hook. Comp. Bot. Mag. II. (1836), p. 357.
Buccinator Rchb. f. Bonplandia II. (1854), p. 115.
cinnamomea Rchb. f. Bonplandia III. (1855), p. 225.
cuprea Lindl. Bot. Reg. 1843, Misc. 125, p. 81.
curtipes Rodrig. *(see Plate.)*
hæmatocantha Lindl. Orch. p. 193.
lata Rchb. f. Gard Chron. 1877, pt. I., p. 653.
Mastodon Rchb. f. Bonplandia III. (1855), p. 69.
tridentata, Lindl. Hook. Comp. Bot. Mag. II. (1836), p. 357.
triquetra Scheidw. Otto et Dietr. Allg. Gartenz. VII. (1839), p. 146.
urostachya Rchb. f. Gard. Chron. 1882, pt. I., p. 765.
xylina Rchb. f. Bot. Zeit. XXXI. (1873), p. 390.

J. Barbosa Rodriguez del. 1876.
Florence H. Woolward lith. 1892.

M&N. Hanhart imp.

MASDEVALLIA ARISTATA *Rodrig.*

MASDEVALLIA ARISTATA Rodrig.

MASDEVALLIA ARISTATA Rodrig. Gen. et Spec. Orch. Nov. I. (1877), p. 30 ; Gard. Chron. 1881, pt. II., p. 236.

Leaf 4 or 5 inches long, oval-lanceolate, dark green, narrowing below into a slender grooved petiole, apex tridenticulate.

Peduncle equalling the leaves, 3-angled, producing several flowers in succession, dull green; bract about $\frac{3}{4}$ inch long, membranous, dull brown, sheathing the base of the terete pedicel.

Ovary about $\frac{3}{8}$ inch long, grooved, pale green.

Sepals cohering, forming a narrow tube about $\frac{3}{8}$ inch long, gibbous below, free portion of dorsal sepal triangular for $\frac{1}{4}$ inch, prolonged into a slender flattened tail about 2 inches long, pale yellow; lateral sepals ovate-triangular for $\frac{1}{2}$ inch, 3-nerved, yellow and brownish-crimson, prolonged into a slender flattened tail nearly 2 inches long.

Petals oblong, apiculate, fleshy, slightly angled on the anterior margin, pale yellow, with minute crimson spots.

Lip oblong, two-lobed, the anterior lobe oval, apiculate, curved, pale yellow, with crimson spots, which are larger on the basal half.

Column a little shorter than the petals, white, apex minutely denticulate.

FOR drawings of this and other Brazilian species, unknown in this country either as living plants or dried specimens, we are indebted to Señor Barbosa Rodriguez, Director of the Botanic Gardens at Rio de Janeiro. *M. aristata* is allied to *M. infracta*, and appears to be also very closely allied to *M. aurantiaca*, a Brazilian *Masdevallia* known by description only. Señor Rodriguez discovered *M. aristata* in January 1876, in the province of Minas Geraes, where it grows upon mossy rocks, and sometimes upon trees, in the dark damp recesses of the forests near Caldas. He states that the flower-stems are perennial, producing fresh flowers annually, and in his drawing the old flower-stalks may be seen appearing above the top of the bract.

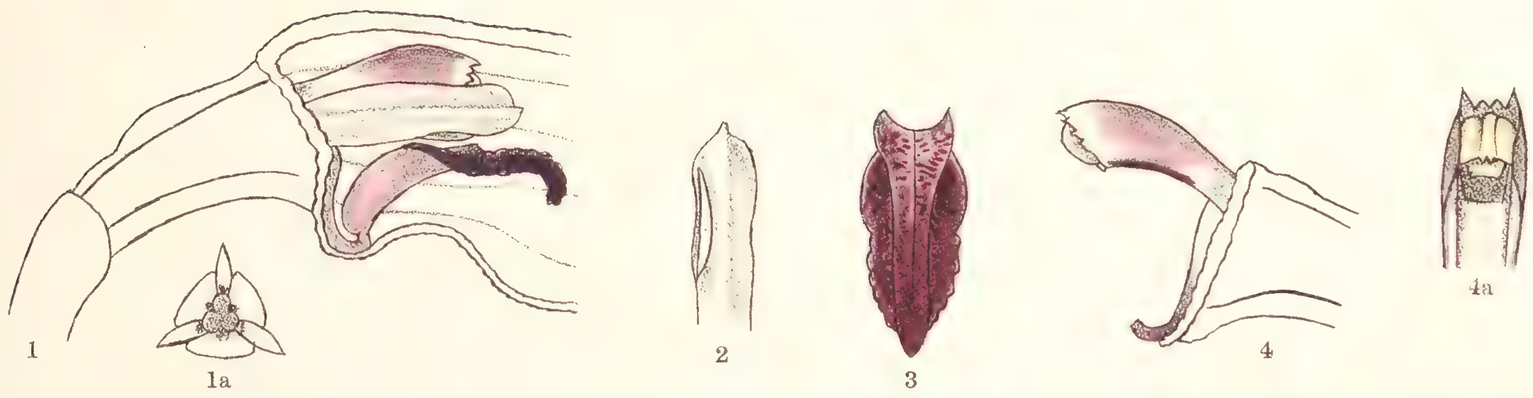
The accompanying Plate is an exact copy of Señor Rodriguez's drawing from nature, intended by him for publication in his "Iconographie des Orchidées du Brézil," and referred to in his "Genera et Species Orchidearum novarum" as "*tab. 377, ined.*"

As no fresh specimens of *M. aristata* are available, the original description by Señor Rodriguez from living plants is here given :

"*Foliis oboval-oblongis, attenuatis in petiolis, acumine emarginato; scapo trigono, foliorum longitudine; sepalis infractis, dorsali minori junctis, longe aristatis; petalis sub-carnosis, semi-canaliculatis apice inæqualiter bi-dentatis; labello oblongo, sub-trilobato, apice acuto, centro canaliculato.*"

Explanation of Plate:

Fig. 1, sepals detached and spread out, *natural size*;—2, petal, inner side;—3, lip, front view;—4, lip, side view;—5, column; *all enlarged*.



Florence H. Woolward del et lith. 1895.

Goater Imp.

MASDEVALLIA AUROPURPUREA *Rchb. f.*

MASDEVALLIA AUROPURPUREA Rchb. f.

MASDEVALLIA AUROPURPUREA Rchb. f. Bonplandia II. (1854), p. 115 *(nomen tantum)* and p. 283 ; III. (1855), p. 69 ; Walp. Ann. VI. (1861), p. 192 ; Otia Bot. Hamb. p. 17 (1878).

Leaf about 5 inches long, oblong-lanceolate, carinate, apex tridenticulate, bright green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle a little longer than the leaves, triquetrous, erect, 2-flowered, each flower with a sheathing apiculate membranous bract concealing the base of the ovary, bright green.

Ovary nearly $\frac{1}{4}$ inch long, curved, with three rounded angles and three acute wings, pale green.

Sepals : dorsal sepal united to the lateral sepals for about $\frac{1}{2}$ inch, forming a narrow tube, gibbous below, free portion triangular, 3-nerved, tapering into a slender tail 1 inch long, bright yellow, faintly tinged with chestnut brown ; lateral sepals cohering for nearly $\frac{3}{4}$ inch, free portion ovate-triangular, 3-nerved, terminating in slender tails about $\frac{1}{2}$ inch long, bright yellow, tinged with chestnut-brown and veined with green, the inner surface dark rich brown, and covered with minute papillæ, the tails yellow and green.

Petals $\frac{1}{4}$ inch long, oblong, apiculate, with a keel on the anterior margin, white.

Lip a little longer than the petals, united to the curved foot of the column by a flexible hinge, oblong-cordate, lobed at the margin, with two longitudinal angled keels, dull purplish-crimson, with darker spots, the apex reflexed and covered with dark crimson papillæ.

Column shorter than the petals, narrowly winged, white and pale purplish-crimson, apex denticulate.

THE first plants of *Masdevallia auropurpurea* were collected by Warscewicz in 1853, at Aspasica and Enllanade, near Ocaña, in the Province of Santander, Colombia, at an elevation of 5,000 feet, and for nearly forty years the species was only known from Reichenbach's description of these dried specimens. In 1894 a plant was purchased from Mr. Sander, of St. Albans, by Mr. F. W. Moore, through whose kindness in sending me fresh flowers I am enabled to publish a drawing of the first plant ever seen in cultivation.

The name *atrorubra* is an unpublished name of Reichenbach's for a dark variety of this species, and the name *atropurpurea* is merely a misprint in the index of Walper's Annales for the word *auropurpurea.*

Our knowledge of the geographical distribution of this species is considerably extended by Mr. Sander's remark to Mr. Moore that his plant undoubtedly came from Peru—about one thousand miles south of Ocaña, where it was originally found, and two or three hundred miles south of the limit given by Consul Lehmann in the following note :

Masdevallia auropurpurea is widely distributed from the north of Colombia southwards into central Ecuador, and is an abundant but extremely local species. It grows upon trees in open woods at an elevation of 1,200 to 1,800 mètres (3,900 to 5,850 feet), and in only one locality in Ecuador I have seen it growing upon rocks. I have found it on the banks of the Rio Pastaza, on the way from Baños on the Vulcan Tunguragua, to Canalos, in Ecuador. In the south of Colombia it is very common all over the highlands of Popayán. On the western slopes of the Central Andes, above Palmira, it grows with *M. Ephippium*, and from thence northwards it occurs in an uninterrupted line as far as Pacorá and Aguadas, in Antioquia, being especially plentiful around Neira and Aranzasu. Along the eastern slopes of the Western Andes it is to be found in several localities, extending as far north as Frontino and Buriticá. It grows in the greatest abundance on the Cordillera de Ben Alcazar, between the towns of Cartago and Caramanta. On the eastern declivities of the Central Andes, which slope towards the basin of the Rio Magdalena, I have seen it in one locality only, in the mountains between Pensilvania and La Victoria.

The mean temperature of the habitat of *M. auropurpurea* ranges between 18° and 20° Centigrade (about 64° to 68° Fahrenheit). The weather during January, February, and March, and again from July to September, is very dry ; while the rainfall during the rest of the year is extremely heavy.

Explanation of Plate, drawn from a plant at the Royal Botanic Gardens, Glasnevin, Dublin :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged.*

J. Barbosa Rodriguz del. 1879.
Florence H. Woolward lith 1892

M&N. Hanhart imp.

MASDEVALLIA CURTIPES *Rodrig.*

MASDEVALLIA CURTIPES Rodrig.

MASDEVALLIA CURTIPES Rodrig. Gen. et Spec. Orch. Nov. II. (1881), p. 95.

Leaf about 5 inches long, linear-lanceolate, narrowing below into a slender grooved petiole, dark green, apex tridenticulate.

Peduncle, including pedicel, about 1½ inch long, terete, ascending from the base of the petiole, dark green, bract ⅝ inch long, ovate, apiculate, membranous, sheathing below, brownish.

Ovary ⅛ inch long, with six grooves, whitish-green.

Sepals cohering, forming a narrow tube about ½ inch long, gibbous below, free portion of the upper sepal very short, triangular, 3-nerved, terminating in a slender tail nearly 1 inch long; lateral sepals roundly triangular, 3-nerved, terminating in slender tails ⅝ inch long, all dull purplish-red, tails bright yellow.

Petals linear, with an angle on the anterior margin near the base, apex hooked, white spotted with crimson.

Lip oblong, with rounded lateral lobes, apex linguiform, acute, recurved, with minute central papillæ, white.

Column very thick, shorter than the petals, white, apex minutely denticulate.

MASDEVALLIA CURTIPES was discovered in 1879 by Senhor Barbosa Rodriguez, in the damp unexplored forests of Rodeio, a few miles north of Rio de Janeiro, flowering in May and June. No drawing of this curious little plant has hitherto been published, the accompanying Plate being a copy of a drawing from nature prepared by Senhor Rodriguez for his great work on the Orchids of Brazil, not yet completed. *M. curtipes* is at present unknown in this country, the only Brazilian species in cultivation being *M. infracta*, from which it differs considerably in the extreme shortness of its flower-stalk and in the dull uniform colour of its flowers.

The original description by Senhor Rodriguez is as follows:

"*M. caule secundario trigono, brevi, multo minore folio; folio lineari-lanceolato, basi attenuato, apice tridentato, antice canaliculato; scapo caule secundario longitudine; sepalis connatis cupuliformibus, superiore minore, breviter triangulato, longe-cristato, inferioribus majoribus et latioribus cum aristis valde productis; petalis carnosis, antice semi-canaliculatis, apice uncinatis; labello trilobato, lobulis lateralibus lamina a basi emarginata, erecta, apice sub-rotunda sub haec lamina est unguis et in apice lobo medio qui est linguiformi, granuloso in centrum, acuto et recurvo.*"

Explanation of Plate:

Fig. 1, sepals detached and spread out, *natural size*;—2, petal, inner side;—3, lip, front view;—4, lip, side view;—5, column; *all enlarged.*

45

Flor.nce H Woodward del.et lith. 1889.

MASDEVALLIA EPHIPPIUM *Rchb. f.*

MASDEVALLIA EPHIPPIUM Rchb. f.

Masdevallia Ephippium Rchb. f. Bot. Zeit. 1873, p. 390 ; Xenia Orch. vol. II. (1874), p. 213, t. 195 ; Gard. Chron. 1874. pt. I., p. 372 ; 1881, pt. II., p. 236 ; Bot. Mag. t. 6208, (1876).

M. Trochilus Lind. Illustr. Hort. vol. XXI. (1874), p. 136, t. 180 ; Gard. Chron. 1873, p. 711 ; 1875, pt. I., p. 504 ; 1881, pt. II., p. 110 ; Floral Mag. 1881, t. 443.

M. Colibri Hort. Burbidge Florist and Pomol. 1873, p. 3 ; Gard. Chron. 1885, pt. I., p. 174.

Var. acrochordonia=Masdevallia acrochordonia Rchb. f. Xenia Orch. vol. II. (1874), p. 213 ; Gard. Chron. 1885, pt. I., p. 174 ; Orchidophile (Godefroy) 1885, p. 199.

Leaf 5 to 10 inches long, 1 or 1½ inch broad, oblanceolate, minutely tridenticulate, narrowing below into a slender grooved petiole, sheathed at the base, bright green.

Peduncle 10 or 12 inches long, many-flowered, each flower falling off before the expansion of the next, ascending from within a sheath at the base of the petiole, acutely angled, angles from one to five, most frequently three ; bright green ; flowering bract 1 inch, or more, long, sheathing, apiculate, pale green.

Ovary ¼ to ⅜ inch long, triangular, with six deep grooves, bright green.

Sepals : dorsal sepal united to the lateral sepals for ⅜ inch, forming a narrow curved tube, ovate for about ½ inch, cucullate, 3-nerved, yellow, with minute brown spots, narrowing into a tail 4 or 5 inches long, yellow, greenish at the back ; lateral sepals cohering for nearly two inches, much inflated, 3-nerved, nerves depressed, with the intervening spaces much distended, colour on the exterior crimson-brown with greenish nerves, on the interior yellow closely covered with small crimson spots, rich crimson near the tube, the nerves thickly studded with large, irregular warts ; terminating abruptly in slender tails 3 or 4 inches long, meeting at the base, diverging towards the extremity, yellow, greenish at the back.

Petals about ¼ inch long, oblong, apiculate, with a prominent keel on the anterior margin terminating in a small angle, and a smaller keel near the opposite margin, white.

Lip a little more than ¼ inch long, grooved at the base, with two triangular lateral lobes, obovate towards the acute apex, white, spotted and barred with crimson.

Column about ¼ inch long, narrowly winged, apex denticulate, white, with wings and back rose-crimson.

THE discoverer of *Masdevallia Ephippium* was undoubtedly Gustav Wallis, in 1868, although the discovery is sometimes ascribed to Dr. Krause, as late as the year 1873. In the Gardeners' Chronicle, 1875, pt. I., p. 504, an interesting account of the discovery of *M. Ephippium*, under the synonym of *M. Trochilus*, is given by Wallis,

who is considered to be a most accurate and trustworthy observer and narrator. "This Masdevallia having been discovered by me, it may be interesting if I communicate some observations respecting it. In the year 1868 I first met with this plant, growing in the frosty heights of the Sonson district in New Grenada. The whole of the plants which I then remitted to Europe died, and I afterwards sent others in the year 1872, to Mons. Linden of Brussels. *M. Trochilus* suffers greatly from tropical heat, and from excess of heat generally. Only a dozen out of 200 plants arrived in Europe the first time—I brought them under my personal care. The name 'Colibri,' which is given to this plant in its native country, is simply an allusion to the fantastic bird-like appearance of the flower—though this allusion is rather far-fetched, as are so many of the allusions in use by the South Americans, especially the Indians. . . . . The general size of the flower does not surpass that of a walnut. The winged sepals have a length of about 4 or 5 inches each. There is a peculiarity of the plant well worth mentioning, and that is its power of producing out of the same spathe several subsequent flowers. I observed many plants in my stores that produced flowers out of the old stalks, which I had considered as being dead. It is possible, therefore, that this *Masdevallia* in its native place has two flowering seasons each year. The strong and compactly-formed root-balls get sometimes to a considerable size and weight. The plant, being once established, must possess an extraordinary vital power. The flower-stalks are exceedingly strong, and have in section a well-marked triangular outline; the leaves are of a bright green colour, short and strong, and of an unusual thickness—the term coriaceous will not suffice for them. *M. Trochilus* has the happy faculty of growing and doing well under any conditions. It grows quite as well in a loose compost as on the bark of trees, or on decomposed pieces of trunk, and even in a common heavy soil. The amateur Orchid-grower will also appreciate its habit of growing in highly elevated regions, as cold as any *Masdevallia* can exist in, not even excepting *M. elephanticeps*."

The long interval which elapsed between the discovery of *Masdevallia Ephippium* in 1868 and the publication of the first description in 1873, can only be accounted for by the fact that the whole of Wallis's first importation of plants perished, and that, apparently, he sent home no dried specimens of the flower. The species appears to have been known to Mons. Linden and others as *M. Trochilus* for some time previous to the publication of Professor Reichenbach's description under the name of *Ephippium* in 1873; although no description of the plant under the name of *Trochilus* was published until 1874.

I am informed by Consul Lehmann that the plant found by Dr. Krause at Loja (formerly Loxa) was the small-flowered variety *acrochordonia*, named and described by Professor Reichenbach as a distinct species. Consul Lehmann, however, considers this plant to be merely a local variety peculiar to the eastern slopes of the Andes, the type, *M. Ephippium*, being found upon the western slopes. A careful examination of the two plants reveals only very slight differences between them, the flowers of *acrochordonia* being always smaller and sometimes less globular than those of *M. Ephippium*, and having the lip and petals slightly narrower and more pointed. The remarkable wart-like processes along the inner surface of the nerves of the lateral sepals are equally present in both plants, although entirely overlooked by Professor Reichenbach in his description of *M. Ephippium*.

Consul Lehmann gives the localities in which he has found the two plants in the following note:

Masdevallia Ephippium Rchb. f. (*Trochilus* Lind.) has the largest geographical distribution of any *Masdevallia* known to me. It was first discovered by Wallis in the State of Antioquia in Colombia, where it grows at various places at an elevation of 1,800 to 2,200 mètres above the sea (5,850 to 7,150 feet), and in huge but not very dense woods, high on trees. From Antioquia the first specimens were introduced into Europe. In 1877 it was observed by myself all along the western slopes of the Central Andes of

the State of Cauca, as far south as the volcano of Sotará, near Popayán. In the vicinity of Popayán it attains the largest proportions, both in masses of root and in the size of the flowers. Masses measuring 40 or 50 centimètres (16 or 20 inches) across are frequently met with. About three years ago (1886) I also found the variety *acrochordonia* on the eastern declivities of the Eastern Andes of Cuenca, in Ecuador. The plants from that locality are much smaller, and the flowers only about half the size of those of *M. Ephippium* in Colombia.

M. Ephippium is never found growing in great abundance over a large area. It invariably occupies small localities—perhaps a small portion of a mountain slope—and will not be met with again for a great distance.

The annual mean temperature ranges between 15° and 18° Centigrade (59° and 64°·4 Fahrenheit), according to the region.

F. C. LEHMANN.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size.*

Florence H. Woolward del et lith 1892

M&N. Hanhart imp.

MASDEVALLIA GUTTULATA *Rchb. f.*

MASDEVALLIA GUTTULATA Rchb. f.

Masdevallia guttulata Rchb. f. Linnæa XLI. (1877), p. 118; Rolfe in Gard. Chron. 1890, pt. II., p. 267.

Leaf about 5 inches long and $\frac{3}{4}$ inch wide, oblong, apex tridenticulate, bright green, narrowing below into a slender grooved petiole, sheathed at the base, pale green.

Peduncle 6 to 10 inches long, erect, 3-angled, bright green, many-flowered, each flower falling off before the expansion of the next; flowering bract about $\frac{3}{8}$ inch long, sheathing below, carinate, apiculate, brownish-green.

Ovary nearly $\frac{1}{4}$ inch long, curved, rounded, with six grooves, pale green.

Sepals: dorsal sepal united to the lateral sepals for about $\frac{1}{4}$ inch, 3-nerved, triangular for $\frac{3}{16}$ inch, tapering into a thick greenish tail $\frac{5}{8}$ inch long; lateral sepals cohering for about $\frac{1}{2}$ inch, 3-nerved, ovate-triangular for $\frac{1}{2}$ inch, tapering very gradually into flattened blunt fleshy tails nearly $\frac{1}{4}$ inch long, greenish; all the sepals dull white, with numerous small tufts of short crimson hairs upon the inner surface, nerves yellowish, prominent on the outer surface.

Petals $\frac{3}{16}$ inch long, linear-oblong, apiculate, pale yellow, with a crimson keel near the anterior margin.

Lip about the length of the petals, grooved, fleshy and cordate at the base, and united to the foot of the column by a flexible hinge, oblong, angled at the margin, apex ovate, apiculate, with numerous minute papillæ, pale yellow, covered with small crimson spots, apex brighter yellow.

Column a little shorter than the petals, narrowly winged, apex scarcely dentate, very pale green, spotted on the foot with crimson.

MASDEVALLIA GUTTULATA was discovered—probably in Ecuador—by Gustav Wallis, whose dried specimens were described by Professor Reichenbach in 1877. As lately as 1890 it was again described by Mr. R. A. Rolfe, of the Royal Herbarium, Kew, who then considered it to be a new species. It is still rare and little-known, and to be found in only a few collections in this country, perhaps owing to its being extremely local in its native habitat. I have received several specimens from Mr. F. W. Moore, of Glasnevin, Dublin, whose plant furnished the photograph for the accompanying woodcut. Messrs. Seeger and Tropp, also, with rare generosity, forwarded to me a living plant in full flower, a most valuable assistance in the completion of my drawings.

The two species most nearly allied to *M. guttulata* are *M. infracta* and *M. Ephippium*, which it resembles in producing several flowers in succession from a thick, angled stem. A curious feature, hitherto unnoticed in any botanical description of this plant, is the

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Explanation of Plate:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged;*—5, apex and section of leaf, *natural size.*

presence of little tufts of stiff hairs scattered over the inner surface of the sepals, and having at first sight the appearance of small crimson spots. This characteristic I have endeavoured to show at fig. 1 of the accompanying Plate.

Consul Lehmann, who appears to be almost the only collector of this species since its discovery by Wallis, gives the following information:

The habitat of *Masdevallia guttulata* is in Ecuador, where it grows on trees in dense, very damp woods, at an elevation of 600 to 1,200 mètres (1950 to 3,900 feet). The annual mean temperature of this region ranges between 21° and 25° Centigrade (about 69° to 77° Fahrenheit), and rain falls all the year round. The distribution of this species appears to be confined to one comparatively small locality, the banks of the Rio Namora in the Eastern Andes of Loja.* I observed it here for the first time in November 1876, and subsequently on various other occasions. Near all the numerous rivers in the vicinity belonging to the same watershed, I have seen no trace of it, although I have found there four other distinct species of this section of the genus *Masdevallia*, three of which are still undescribed. *M. guttulata*, though not a profusely flowering species, is constantly in bloom in a wild state, and even when cultivated at one of my orchid stations in Colombia, it is remarkable for this characteristic.

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* I am informed by Mr. William Bull that he has received this species "from the Ocaña district"—more than nine hundred miles north-east of Loja.—F. H. W.

Florence H. Woolward del. et lith. 1890.

Hanhart imp

MASDEVALLIA INFRACTA *Lindl.*

MASDEVALLIA INFRACTA Lindl.

Masdevallia infracta Lindl. Gen. et Sp. Orch. (1883), p. 193; Bot. Reg. 1838, p. 40, misc. 64; Belg. Hort. XXIII. (1873), p. 357, t. XXII; Flore des Serres, vol. XXIII. (1880), p. 43, t. 2389; Gard. Chron. 1881, pt. II., p. 305.

M. longicaudata Lemaire Illustr. Hort. vol. XV. (1868), misc. p. 109; Gard. Chron. 1881, pt. II., p. 305.

M. albida Pinel MSS. *fide* Lemaire Illustr. Hort. vol. XV. (1868), misc. p. 109.

Var. purpurea Rchb. f. Gard. Chron. 1883, pt. II., p. 460; Orchidophile (Godefroy) vol I. (1883), p. 761.

Leaf 4 or 5 inches long, about $\frac{3}{4}$ inch wide, oblong-lanceolate, fleshy, apex tridenticulate, bright green, very shining, narrowing into a slender grooved petiole, pale green.

Peduncle 6 or 8 inches long, erect, sometimes terete, more often angled, bright green, many-flowered, each flower falling off before the expansion of the next; bracts about $\frac{3}{4}$ inch long, carinate, apiculate, sheathing below, ovate above, bright green or brownish.

Ovary about $\frac{1}{4}$ inch long, with three broad and three narrow rounded angles, whitish or pale green.

Sepals: dorsal sepal united to the lateral sepals for about $\frac{1}{2}$ inch, forming a wide tube, free portion triangular-ovate for about $\frac{3}{8}$ inch, 3-nerved, cucullate, purplish-pink, terminating in a slender tail $1\frac{1}{2}$ inch long, greenish-yellow; lateral sepals cohering for about $\frac{3}{4}$ inch, gibbous below, roundly ovate, 3-nerved, purplish-pink, darker along the nerves, terminating in slender greenish tails, $\frac{3}{4}$ inch long.

Petals about $\frac{1}{4}$ inch long, linear, apiculate, anterior margin slightly keeled, inner surface viscid below the keel, white, with pale pink spots, apex pale yellow.

Lip about $\frac{1}{4}$ inch long, oblong-pandurate, angled and keeled, margins and apex reflexed, dull pink with numerous crimson spots, apex dull orange and crimson.

Column nearly $\frac{1}{4}$ inch long, narrowly winged, white and pale green, apex crenate.

MASDEVALLIA INFRACTA was discovered by Descourtilz, a French traveller and botanist, in the year 1809, and is therefore the oldest *Masdevallia* in cultivation, the only species discovered at an earlier date being the Peruvian *M. uniflora*, upon which the genus was founded in 1798 by Ruiz and Pavon. This species is now of uncertain identity, and was never introduced into cultivation.

The first imported plants of *M. infracta* were probably those sent to Paris in 1828 by Mons. Pinel, a resident near Rio de Janeiro. These plants were supplied to him by Morel, who, during his explorations in the surrounding country, collected them at Penna near Canta Gallo. A drawing of the plant was made in 1838 by a daughter of Mons. Pinel, and published thirty years afterwards in "L'Illustration Horticole," by the Editor, Mons. Lemaire, who thought fit to substitute the specific name *longicaudata* for that of *albida*, under which the drawing was sent to him. The first description of *M. infracta* was published by Dr. Lindley in March, 1833.

Explanation of Plate, drawn from a Plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

In 1836 the plant was found by Dr. Gardner, who sent home numerous dried specimens, some of which are preserved in the British Museum of Natural History, and others—together with a drawing by the collector—in the Royal Herbarium, Kew. The first living plants imported into England were sent in 1837 by Dr. Gardner to Messrs. Loddiges, in whose establishment at Hackney they flowered the following year.

Variations occasionally occur in the colour of the flowers, and one variety, introduced by Mr. Bull, was named by Professor Reichenbach *var. purpurea.* It has large flowers of an uniform shade of violet-purple. In some plants the winged or angled stem, characteristic of most species allied to *M. infracta*, is replaced by a slender rounded stem.

The only known habitat of *M. infracta* is Brazil, where it is found in the mountains called by the Portuguese Serra dos Orgãos, or Organ Mountains, from a fancied resemblance of their granite peaks to the pipes of an organ. These peaks form part of a mountain range situated about sixty miles to the north of Rio de Janeiro, branching out in various directions, and stretching from near Bahia in lat. 12° S., to S. Catharina in lat. 29° S. Many small rivers take their rise in the Organ Mountains, spreading into wide clear pools, and traversing valleys of deep rich alluvial soil before falling into the Bay of Rio. The sides of the mountains are clothed with forest trees of large size, and upon the mossy stems and branches, as well as on the sides of banks, *M. infracta* was found in abundance by Dr. Gardner, flowering from November to January. All the steeper declivities are overspread with beautiful flowering shrubs, the summits of the smaller peaks being composed of enormous loose blocks of granite covered with lichens and small Orchids. The summit of the highest peak, about 7,500 feet above the level of the sea, is formed of one broad flat surface of granite of considerable extent, bare for the most part, but here and there covered with small stunted shrubs, and showing many little excavations in the surface, filled with excellent water.

The temperature during the cool months of May and June is sometimes as low as 32° just before daybreak, but in the hot and rainy months of January and February it rises to 84° at noon. Violent thunder-storms occur almost daily, coming on regularly at 4 p.m., and leaving the evening atmosphere fresh and cool.

The above description of the Organ Mountains is taken from Dr. Gardner's "Travels in Brazil," published in 1849.

Florence H.Woolward del.et lith. 1890.

Hanhart imp.

MASDEVALLIA MACULATA *Klotzsch*.

MASDEVALLIA MACULATA Klotzsch.

MASDEVALLIA MACULATA Klotzsch et Karst. Allg. Gartz. (Otto und Dietrich) XV. (1847), p. 330; Walp. Ann. I. (1849), p. 774; VI. (1861), p. 190; Bonplandia II. (1854), p. 23; Belg. Hort. XXIII. (1873), p. 359; Flore des Serres t. 2150 (1875); Gard. Chron. 1848, p. 103; 1881, pt. II., p. 336; Veitch Manual Orch. pt. V. (1889), p. 51.

Var. flava Veitch Manual Orch. pt. V. (1889), p. 52.

Leaf 6 or 7 inches long, linear-lanceolate, slightly carinate, apex tridenticulate, bright green, narrowing below into a grooved petiole, sheathed at the base.

Peduncle 8 or 10 inches long, sharply angled (angles two, three, or four), producing several flowers, each flower falling off before the expansion of the next, bright green; flowering bract about 1 inch long, carinate, apiculate, pale green, sheathing the numerous buds and the base of the terete reddish pedicel.

Ovary about $\frac{1}{4}$ inch long, with three rounded angles and three wings, pale green.

Sepals: dorsal sepal united to the lateral sepals for about $\frac{5}{8}$ inch, forming a narrow tube, free portion ovate-triangular for $\frac{1}{4}$ inch, 3-nerved, yellow, shaded and spotted with red, tapering into a fleshy flattened tail about 3 inches long, bright orange, greenish at the back; lateral sepals cohering for $1\frac{1}{4}$ inch, oblong-ovate, 3-nerved, reddish-yellow at the margins, crimson in the centre, with dark nerves and spots, tapering into slender pale lemon-coloured tails, 2 inches long.

Petals about $\frac{1}{4}$ inch long, oblong, apiculate, anterior margin slightly keeled, white and very pale yellow.

Lip about $\frac{1}{4}$ inch long, pandurate, with two angles, dull purple, spotted with dark crimson, apex rough with dark crimson papillæ.

Column $\frac{1}{4}$ inch long, white, very narrowly winged with crimson, apex crenate.

MASDEVALLIA MACULATA was discovered by Wagener at La Silla near Caracas, at an altitude of 8,000 feet, growing in woods on the branches of trees, and flowering in June and August. Wagener's imported plants flowered in 1847 at the Botanic Gardens, Berlin, for the first time in cultivation.

A well-known variety of *M. maculata, var. flava* (of which a flower is represented in the accompanying Plate), has small bright lemon-yellow flowers, tinged inside with reddish-brown. The petals, etc. are identical in structure with those of the type, but the column has none of the purple shading, and the lip is paler in colour. This variety was imported from Caracas by Messrs. Sander of St. Albans in 1881.

A nearly allied species—or possibly a form of the same—is *M. bicolor*, described and figured in 1838 by Poeppig and Endler (Nov. Gen. et Spec. II., p. 6), and found growing on trees in the woods of Cuchero, in the eastern mountains of Peru, flowering in January. It has the angled stem usual to species of the same section, and flowers of the same colouring as those of *M. maculata*, but it is a much smaller plant, both leaves and stem being scarcely four inches in height. Living specimens of *M. bicolor* have never been imported, and until the plant has been re-discovered and carefully examined, its identity with *M. maculata* must remain uncertain.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged;*—5, apex and section of leaf, *natural size.*

Consul Lehmann gives much additional information as to the climate and localities in which *M. maculata* is found:

The habitat of *Masdevallia maculata* is in Venezuela and Colombia, at an elevation of 1,400 to 1,700 mètres (4,550 to 5,525 feet). It flowers from August to December, and in cultivation at Popayán it is never without flowers. In Venezuela it grows in the colony of Tovar near Caracas, and in the mountainous parts of the Estado de Carabobo, a name given by the Spaniards to the tract of country between the Atlantic Ocean and the Lake of Valencia, bounded on the west and south-west by the State of Yaracuy and the Llanos de San Carlos and Calabozo.

In Colombia it occurs, although very rarely, in the extensive highlands of Popayán, from the Rio Ovejas to the Rio Hondo, in woods of a remarkably open and park-like aspect. These woods consist chiefly of trees and shrubs of the following genera: *Weinmannia, Clusia* (Balsam-tree), *Thibaudia, Bejaria, Gaultheria, Clethra, Myrtus* (Myrtle), *Psidium* (Guava), *Freziera, Cinchona, Inga* (Soldier-wood), *Ficus* (Fig), *Quercus* (Oak), *Anona* (Custard-apple), *Meriania* (Jamaica-rose), *Leandra, Miconia*, etc. The trunks of the trees are covered with small lichens and a few mosses, and more rarely with ferns and Bromeliads. Orchids of the following genera are to be found in these woods: *Pleurothallis, Stelis, Lepanthes, Restrepia, Comparettia, Burlingtonia, Epidendrum, Sobralia*, and *Evelyna;* with *Oncidium obryzatum, O. panduratum* and *O. globuliferum; Masdevallia auropurpurea, M. maculata, M. Ephippium, M. amanda*, and a few others.

The climate of this region is remarkable for dense fogs and heavy rains, with frequent and very violent thunder-storms. During the rainy season the nights are generally clear, but towards daybreak dense fogs gather, and lie close above the woods, resembling, if observed from the higher regions of the Cordilleras, immense loose masses of cotton wool. At about 8 o'clock these fogs begin to rise and to form large cumulus clouds, which, from 2 o'clock p.m. condense and fall in heavy showers, accompanied by severe thunder-storms, lasting as a rule until night. The dry season in Venezuela is from January to the end of March, and in Cauca from July to September.

The annual mean temperature is between 18° and 19° Centigrade (about 64° to 66° Fahrenheit), and the extremes are 15° and 25° Centigrade (59° and 77° Fahrenheit).

F. C. Lehmann.

Florence H. Woolward. del. et lith. 1890.

Hanhart imp.

MASDEVALLIA SCHLIMII *Lindl.*

MASDEVALLIA SCHLIMII Lind.

Masdevallia Schlimii Lind. MSS. Lindl. Orch. Lind. (1846), p. 5 ; Bonplandia II. (1854), pp. 23 and 283 ; Walp. Ann. VI. (1861), p. 194 ; Belg. Hort. XXIII. (1873), p. 360 ; Gard. Chron. 1883, pt. I., p. 532, fig. 80 ; Orchidophile (Godefroy) 1883, p. 662 ; Bot. Mag. t. 6740 (1884) ; Die Natürl. Pflanzenfam. (Engler und Prantl) pt. 23 (1888), p. 137, fig. 135 ; Veitch Manual Orch. pt. V. (1889), p. 61.

Var. Sceptrum=Masdevallia Sceptrum Rchb. f. Bonplandia II. (1854), p. 283 ; Walp. Ann. VI. (1861), p. 194 ; Belg. Hort. XXIII. (1873), p. 360.

Var. polyantha=Masdevallia polyantha Lindl. Orch. Lind. (1846), p. 6 ; Bonplandia II. (1854), p. 283 ; III. (1855), p. 69 ; Walp. Ann. VI. (1861), p. 193 ; Belg. Hort. XXIII. (1873), p. 360.

Leaf 10 or 12 inches long, obovate, carinate, apex tridenticulate, very bright green, the principal nerves paler, narrowing below into a very pale green grooved petiole, sheathed at the base.

Peduncle 14 or 15 inches long, with two or three sheathing bracts, terete, ascending from within a sheath at the base of the petiole, racemose, producing six or eight flowers, each on an erect pedicel 1 or $1\frac{1}{2}$ inch long, at intervals of $\frac{3}{4}$ or $\frac{1}{2}$ inch, pale green dotted with dull red ; flowering bracts about $\frac{1}{2}$ inch long, apiculate, sheathing below, brownish.

Ovary $\frac{1}{4}$ inch long, triangular, with six deep grooves, slightly winged, green.

Sepals : dorsal sepal united to the lateral sepals for $\frac{1}{4}$ inch, forming a narrow tube, free portion triangular for about $\frac{1}{4}$ inch, 3-nerved, nerves carinate without, bright yellow, with minute reddish-brown spots, terminating in a slender yellow tail about 2 inches long ; lateral sepals cohering for $\frac{3}{4}$ inch, gibbous at the base, 3-nerved, obovate for $\frac{3}{4}$ inch, yellow, closely spotted with velvety, dull crimson spots, over which is a purplish lustre, tapering into slender yellow tails $1\frac{1}{2}$ inch long.

Petals $\frac{1}{4}$ inch long, linear-oblong, acutely angled on both margins, with a fleshy keel on the anterior margin, white, apex very pale yellow.

Lip nearly $\frac{1}{4}$ inch long, oblong, curved, with two curved keels on the anterior portion, base fleshy, grooved, whitish, mottled with transverse crimson spots, apex much reflexed, yellow spotted with crimson.

Column above $\frac{1}{4}$ inch long, narrowly winged, apex slightly crenate, white edged with crimson.

MASDEVALLIA SCHLIMII was discovered in 1843 by Louis Schlim, growing on trees at Valle, near Merida in Venezuela, at an elevation of 7,500 feet, and was first described by Dr. Lindley in 1846, under the name proposed for it by Linden in

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Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size.*

honour of its dicoverer, his fellow-traveller and half-brother. It has subsequently been found in various localities of the Eastern Cordilleras of Colombia, and the first living plants were imported by Messrs. Sander, of St. Albans, in 1883.

Varieties of *M. Schlimii* have from time to time been found, and have in some instances received specific names. The variation seems to be chiefly in size and in the depth of colouring of the flowers, and may possibly be accounted for by the great difference of elevation and climate, and the more or less exposed situations in which the plants grow, a difference quite sufficient—especially in the case of the variety *polyantha*—to cause even greater variation than has yet been met with.

The best-known variety, *polyantha*, which has smaller and more compactly arranged flowers, was found by Schlim at Ocaña, in Colombia, about the same date as *M. Schlimii*, and was described by Dr. Lindley as a distinct species. The locality is given in the field-note of the collector, as follows: "An epiphyte at the entrance of the Páramo of Portachuela, in the Province of Merida, at the height of 11,500 feet, between Bailadores and La Grita; June to September." The mean temperature of this elevated region is 46° Fahrenheit.

The plant figured in the Botanical Magazine, t. 6740, as *M. Schlimii*, is now considered to be the variety *polyantha*. This specimen, taken from the collection of Sir Trevor Lawrence, is preserved in the Royal Herbarium at Kew. The leaves are more rounded than those of *M. Schlimii*, and the flowers are smaller and less closely spotted, with the margins of the lateral sepals much reflexed.

Another probable variety, named as a distinct species *M. Sceptrum* by Professor Reichenbach, was collected by Schlim at La Baja and Pamplona, at an elevation of 8—9,000 feet, flowering in January. It appears to differ from *M. Schlimii* only in having smaller and darker flowers. In Professor Reichenbach's description both of *M. Sceptrum* and *M. polyantha* (Bonplandia II. p. 283), he mentions that the stem is angled or winged, a character not noticed by Dr. Lindley in his original description of *M. polyantha*. No plant under the name of *M. Sceptrum* has ever been in cultivation, although dried specimens have occasionally been sent home under this name by various collectors. To the courtesy of Mr. F. Sander, of St. Albans, I am indebted for an opportunity of examining one of these specimens, found at Ocaña in 1886, of which the chief characteristics agree in all respects with those of *M. Schlimii*, the tails being perhaps a little thicker, flatter and shorter.

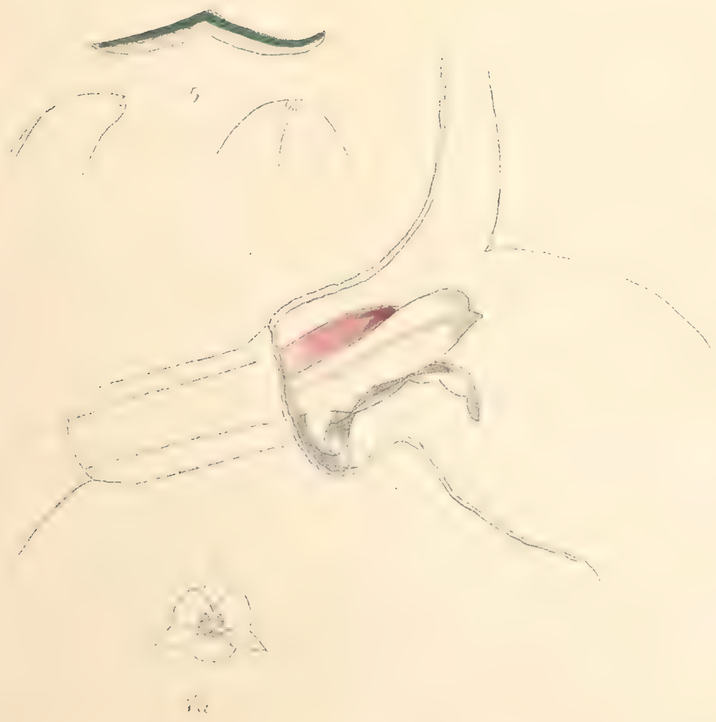
Consul Lehmann sends the following note:

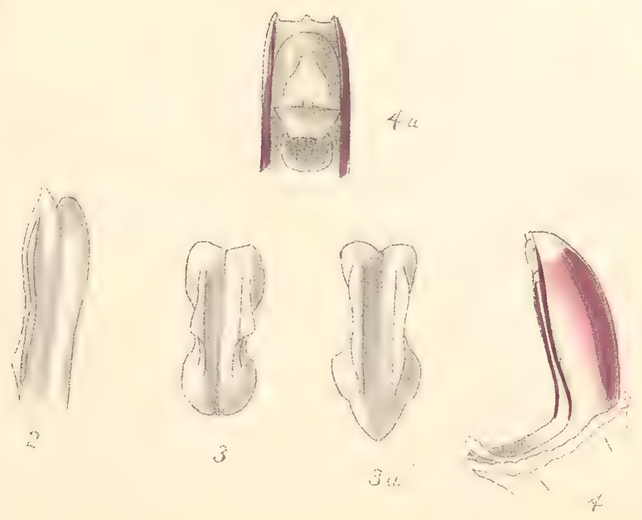
The habitat of *M. Schlimii* is in Colombia and Venezuela, at an elevation of 1,800 to 2,500 mètres (5,850 to 8,125 feet). The region over which this species is distributed begins on the western slopes of the Eastern Cordilleras of Colombia near Sogamoso, continuing northward as far as the bifurcation of the Cordillera at the Páramo de Santurban, and from thence north-eastward as far as Merida in Venezuela. In its habit of growth it greatly resembles *Masdevallia Ephippium*, growing abundantly on trees in damp, but open and park-like woods, and limited to small localities, large districts intervening without a trace of the plant to be seen.

The mean temperature of this region is between 14° and 17° Centigrade (about 57° to 63° Fahrenheit).

A much greater elevation is assigned by some authorities to *Masdevallia Schlimii*—as much as 11,000 feet—but I must remark that this altitude is not attained by the true *M. Schlimii*, nor by any allied species or variety with which I am acquainted, with the exception of *Sceptrum*, *polyantha*, and *M. Ephippium var. acrochordonia*. None attains a greater elevation than 2,500 mètres (8,125 feet), and most of them are found at 800 to 1,700 mètres (2,600 to 5,525 feet). The elevation of 11,000 feet is reached in Colombia by very few species of *Masdevallia*, and those chiefly of the sections *Coriaceæ* (Rchb. f.) and *Cucullatæ* (Rchb. f.).

F. C. Lehmann.





Florence H.Woolward del.et lith.1889.

MASDEVALLIA TOVARENSIS *Rchb.f.*

Hanhart imp.

MASDEVALLIA TOVARENSIS Rchb. f.

Masdevallia tovarensis Rchb. f. Linnæa XXII (1849), p. 818 ; Walp. Ann. III. (1852), p. 523 ; VI. (1861), p. 192 ; Bonplandia III. (1855), p. 225 ; Bot. Mag. t. 5505 (1865) ; Gard. Chron. 1865, p. 914, fig. B ; 1871, p. 1421, fig. 310, B, and p. 1486 ; 1874, pt. II., p. 715 ; 1881, pt. II., p. 409, fig. B ; Fl. and Pomol. 1873, p. 169, fig. 5 ; Belg. Hort. XXIII. (1873), p. 360 ; Illustr. Hort. XXVI. (1879), p. 169, t. 363 ; De Puydt, Les Orch. (1880), p. 287, pl. XXIV.

M. candida Klotzsch et Karst. Bonplandia II. (1854), p. 23 ; Walp. Ann. VI. (1861), p. 192 ; Gard. Chron. 1871, p. 1421 ; Belg. Hort. XXIII. (1873), p. 355.

Leaf about 6 inches long, oblong-ovate, tridenticulate, narrowing below into a grooved petiole sheathed at the base, dark green.

Peduncle 5 or 6 inches long, sharply angled, angles two to five, many-flowered, ascending from within a sheath at the base of the petiole, bright green ; bracts about ½ inch long, sheathing, apiculate, bright green.

Ovary nearly ¼ inch long, with three acute angles, bright pale green.

Sepals : dorsal sepal united to the lateral sepals for about ¼ inch, forming a narrow tube, free portion triangular, 3-nerved, tapering into a slender tail about 1¾ inch long ; lateral sepals cohering for nearly 1 inch, free portions broadly oval, 3-nerved, terminating in slender tails about ⅝ inch long ; all pure white, with pale yellowish-green tails.

Petals ¼ inch long, linear, apiculate, angled on the anterior margin, white.

Lip about ¼ inch long, slightly grooved at the base, united to the foot of the column by a flexible hinge, pandurate, with two longitudinal keels, apex reflexed, white.

Column scarcely ¼ inch long, narrowly winged, apex denticulate, white, tinged and winged with purple-crimson.

THIS species was discovered in 1842 by Linden, at an elevation of 2,000 mètres (6,500 feet), near Tovar, a small German colony in Venezuela, and named—in manuscript only—*Masdevallia candida.* The first botanical description of the plant was published under the name of *M. tovarensis* by Professor Reichenbach in 1849, from dried specimens collected in 1846 by Moritz in the same habitat. Several years afterwards, living plants under the name of *M. candida* were sent to Germany by Wagener, who collected them near Caracas at an elevation of 6,000 feet. One of these plants, sold to the late Mr. Sigismund Rücker, flowered in 1864 for the first time in England in his collection at West Hill, Wandsworth, and was identified with Professor Reichenbach's *M. tovarensis.*

A hybrid has been raised from *M. tovarensis* and *M. ignea* in the collection of Captain Hincks, of Breckenbrough, Yorkshire, and named in his honour by Professor Reichenbach *M. Hincksiana* (Gard. Chron, 1887, pt. II., p. 214). The flowers are more

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Explanation of Plate, drawn from a Plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, lip from another specimen ;—4, column ; *all enlarged ;*—4a, apex of column *(much enlarged);* —5, apex and section of leaf, *natural size.*

slender than those of *M. tovarensis*, and are of a delicate golden-yellow colour. It is curious to note that the terete flower-stems usually produce more than one flower, the plant in this respect resembling the many-flowered *M. tovarensis*, the pollen-plant *M. ignea* having solitary flowers.

Two other hybrids have been raised, both by Messrs. Sander, of St. Albans: *M. Measuresiana* (Gard. Chron. 1890, pt. II., p. 379), white, bordered and nerved with lilac, the tails darker, a hybrid between *M. amabilis* and *M. tovarensis*; and *M. Amesiana* (Gard. Chron. 1891, pt. I. p. 38, and pt. II. p. 197), apricot colour—raised from *M. Veitchiana* and *M. tovarensis*.

Consul Lehmann sends the following note:

Up to this date, *Masdevallia tovarensis* appears to have been found only in the small colony of Tovar, near Caracas in Venezuela, at an elevation of 1,500 to 1,800 mètres (4,875 to 5,850 feet). It grows on trees in open, park-like woods, under exactly the same conditions as *M. maculata*.

F. C. LEHMANN.

SECTION IX.

RACEMOSÆ.

IT is impossible to class *M. racemosa* with any other cultivated species, because it differs so essentially from them all. By the advice of Consul Lehmann I place in the same Section *M. Eduardi*, which, although very much smaller, has also creeping rhizomes, producing leaves at intervals, and bearing two or three scarlet flowers upon one stem.

1 species figured:

Masdevallia racemosa Lindl.

Not in cultivation:

M. Eduardi Rchb. f. Gard. Chron. 1880, pt. II., p. 778.

Florence H. Woolward del. et lith. 1892.

M&N. Hanhart imp.

MASDEVALLIA RACEMOSA *Lindl.*

MASDEVALLIA RACEMOSA Lindl.

MASDEVALLIA RACEMOSA Lindl. Ann. Mag. Nat. Hist. XV. (1845), p. 256; Benth. Plant. Hartw. (1846), p. 258; Rchb. f. Bonplandia III. (1855), p. 69; Walp. Ann. VI. (1861), p. 193; Gard. Chron. 1881, pt. II., p. 336; 1883, pt. II., p. 466; 1884, pt. I., p. 736 and 737, fig. 139; Veitch Manual Orch. pt. V. (1889), p. 58.

Leaf 4 or 5 inches long and about $\frac{3}{4}$ inch wide, oblong-ovate, apex tridenticulate, margins recurved, dull greyish-green, narrowing below into a slender grooved petiole, sheathed at the base and produced from a creeping rhizome at intervals of 1 or $1\frac{1}{2}$ inch.

Peduncle 8 to 15 inches long, erect, slender, terete, dull reddish-green, many-flowered, the flowers developing in succession, two or three only being expanded at the same time, the pedicel of each having a sheathing brown membranous bract at the base, $\frac{3}{8}$ inch long, embracing the peduncle and the pedicel.

Ovary nearly $\frac{1}{4}$ inch long, with six rounded angles, bright crimson.

Sepals: dorsal sepal united to the lateral sepals for about $\frac{1}{2}$ inch, forming a straight narrow tube, free portion ovate-triangular for $\frac{1}{4}$ inch, 3-nerved, terminating in a tail about $\frac{1}{4}$ inch long; lateral sepals cohering for 1 inch or a little more, broadly cordate, 3-nerved, terminating in a small blunt point; all the sepals orange-scarlet with the nerves and margins vermilion, tube yellowish-scarlet.

Petals $\frac{1}{4}$ inch long, oblong-ovate, anterior margin slightly thickened, pale yellow.

Lip about $\frac{3}{8}$ inch long, linear, with two slightly carinate longitudinal lines, ivory-white, united to the foot of the column by a flexible hinge.

Column a little longer than the petals, slender, very narrowly winged, apex very minutely dentate, pale yellow and pink, with a few small pink spots, and one deep purple spot on each side of the foot.

MASDEVALLIA RACEMOSA was discovered near Popayán by Hartweg, whose dried specimens were named and described in 1845 by Dr. Lindley. A second description, also written by Dr. Lindley, appeared in May, 1846, in Bentham's "Plantas Hartwegianas," a work begun in 1839 and published in parts; and the date 1839 on the title-page has caused the erroneous impression that the plant was first described in that year. Hartweg states that he discovered the plant in woods at Pitayo and also on the slopes of Purace near Popayán, at an elevation of 10,000 to 14,500 feet. It was subsequently found by other collectors in the same part of the Central Cordillera of Popayán. No living plants, however, were sent to this country until 1883, when Messrs. Shuttleworth and Carder succeeded in importing a small number. The difficulties of importing plants—and, it is said, especially *Masdevallia racemosa*—from such high altitudes, are numerous, owing chiefly to the great difference of temperature between the cool fresh

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Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged;*—5, apex and section of leaf, *natural size.*

air of their native habitat and the hot steaming atmosphere of the lowlands near the coast or the navigable rivers. Delays in the tropical heat of various ports have also to be encountered—four days at Colon, two days at Jamaica, etc.—before the twelve days' voyage across the Atlantic is even begun. Pathetic accounts are given by collectors of the injury sustained by their treasures fermenting rapidly in the intense heat of the ship's hold, daily examination revealing the damage done, and necessitating the throwing overboard of rare plants which would have realised a fortune if brought alive to Europe.

The first drawing of *M. racemosa* was one by Consul Lehmann, published in the Gardeners' Chronicle in 1884. He found his specimens growing on the ground, rarely on trees, in moderately thick woods on the western slopes of the Páramo de Moras, de las Delicias, and del Guanaca, at an elevation of 2,900 to 3,800 mètres (about 9,416—12,350 feet).

The mistaken idea that each flower-stem of *M. racemosa* produces numerous flowers expanded at the same time, seems to have originated in the fact that some dried specimens with ten to fourteen flowers carefully arranged upon the dead stalks were exhibited at the first sale of living plants, in 1883. The number of flowers developed at the same time never exceeds four and rarely exceeds two; among many specimens, both dried and living, I have never seen a stem with more than two open flowers. In Consul Lehmann's descriptions of wild specimens collected by him, he mentions that the flowers appear *in succession*, sometimes as many as eighteen upon one stem.

The structure of *M. racemosa*, and the curious growth of the leaves at intervals along the creeping rhizomes, distinguish it so clearly from all other known species that it cannot be classed in any of the sections originated by Professor Reichenbach.

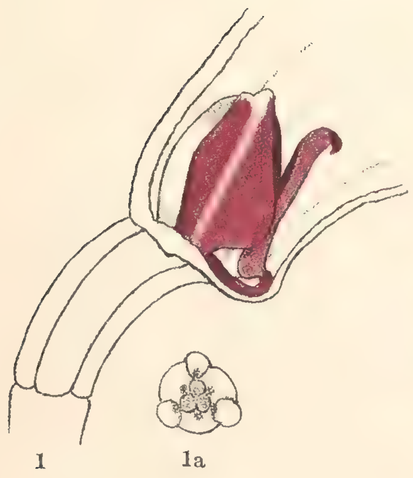
SECTION X.

REICHENBACHIANÆ.

THIS Section contains all the species allied to *M. Reichenbachiana*, a plant which Reichenbach temporarily included among the *Coriaceæ*. All are in cultivation, and are distinguished from the *Coriaceæ* by the less substantial texture of their flowers and leaves, by the deep narrow tube, and by the carinate veins upon the inner surface of the lateral sepals. I have chosen the above name for this Section, partly because the type species is a familiar one and easily calls to mind its allies, and partly in honour of Professor Reichenbach, who named and described more Masdevallias than any other botanist.

7 species figured :

Masdevallia calura Rchb. f.
demissa Rchb. f.
fulvescens Rolfe.
marginella Rchb f. (=*M. Costaricensis Rolfe.*)
Reichenbachiana Endres.
Rolfeana Kränzl.
Schroederiana hort. Sander.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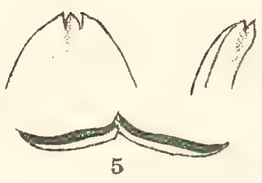
1a

2

3

4

4a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Florence H. Woolward del et lith. 1895.

Goater Imp.

MASDEVALLIA CALURA *Rchb. f.*

MASDEVALLIA CALURA Rchb. f.

MASDEVALLIA CALURA Rchb. f. Gard. Chron. 1883, pt. II., p. 230; Orchidophile (Godefroy) 1883, p. 756.

Leaf about 4 inches long, oblong-lanceolate, carinate at the back, apex tridenticulate, margins slightly recurved, bright green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle a little longer than the leaves, terete, with two or three sheathing bracts, ascending from the base of the petiole, dull red; flowering bract about ½ inch long, apiculate, sheathing below, pale green.

Ovary ¼ inch long, with three large and three small rounded angles, shining, dark crimson.

Sepals: dorsal sepal united to the lateral sepals for about ⅝ inch, forming a narrow tube, gibbous below, free portion very short, triangular-ovate, 3-nerved, tapering into a slender tail nearly 2 inches long, lateral sepals cohering for ¾ inch, roundly triangular, with three or four keeled nerves, tapering into slender flattened tails nearly 1½ inch long; all dark shining crimson, tails yellow, tipped with orange, and greenish at the back.

Petals about ⅛ inch long, fleshy, oval, with a triangular apex, and a small angle a little below, anterior margin rounded and much thickened, rich crimson, with a white apex and margin.

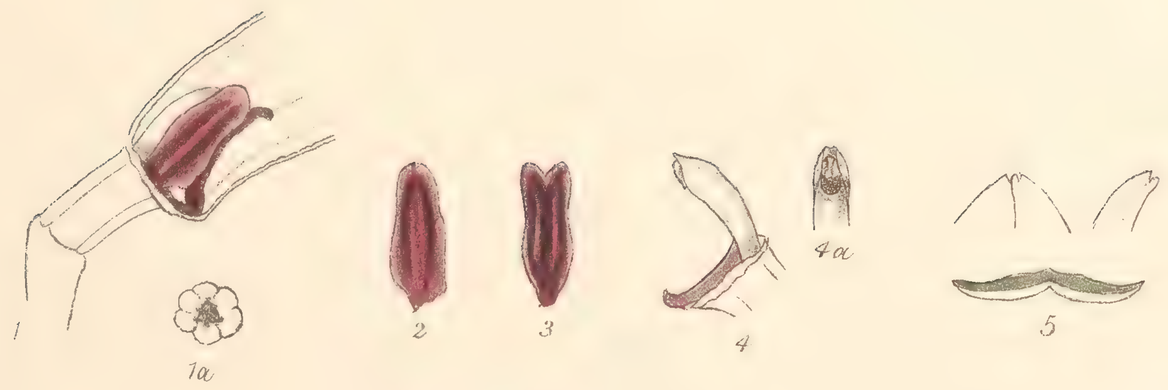
Lip scarcely as long as the petals, fleshy, united to the foot of the column by a flexible hinge, pandurate, with two longitudinal keels, apex rounded and reflexed, dark crimson.

Column equalling the petals, white, broadly edged with crimson, foot rich crimson.

MASDEVALLIA CALURA was discovered and introduced into cultivation by Consul Lehmann, who sent plants to Messrs. Sander in 1882. It grows with *M. Reichenbachiana* on the western slopes of the Vulcan Irazú, near San Isidro, in Costa Rica, at an elevation of 1,600 to 2,000 mètres (5,200 to 6,500 feet.)

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.



Florence H. Woolward del. et lith. 1893.

M & N. Hanhart imp.

MASDEVALLIA DEMISSA *Rchb. f.*

MASDEVALLIA DEMISSA Rchb. f.

Masdevallia demissa Rchb. f. Gard. Chron. 1887, pt. II., p. 9 ; Orchidophile (Godefroy) 1888, p. 168 ; Veitch Manual Orch. pt. V. (1889), p. 39.

Leaf 5 or 6 inches long, oblong-spathulate, carinate at the back, leathery, apex tridenticulate, bright green, narrowing below into a pale green grooved petiole, sheathed at the base.

Peduncle, including pedicel, about 2 inches long, terete, ascending from within the sheath at the base of the petiole, with two sheathing bracts, pale green ; flowering bract about $\frac{3}{8}$ inch long, oblong-ovate, apiculate, sheathing below, pale brownish green.

Ovary $\frac{1}{4}$ inch long, with six grooves, shining green.

Sepals : dorsal sepal united to the lateral sepals for nearly $\frac{3}{4}$ inch, forming a narrow curved tube, free portion very short, triangular, 3-nerved, terminating in slender tail about 1 inch long, bright yellow shaded with chestnut-brown ; lateral sepals cohering for $\frac{3}{4}$ inch, triangular-ovate, 3-nerved, terminating in slender recurved tails nearly $\frac{3}{4}$ inch long, bright chestnut-brown with orange veins, all the tails orange, greenish at the back.

Petals about $\frac{1}{4}$ inch long, oblong, with a rounded angle on the anterior margin, thick and fleshy, dull crimson-purple, paler at the margin.

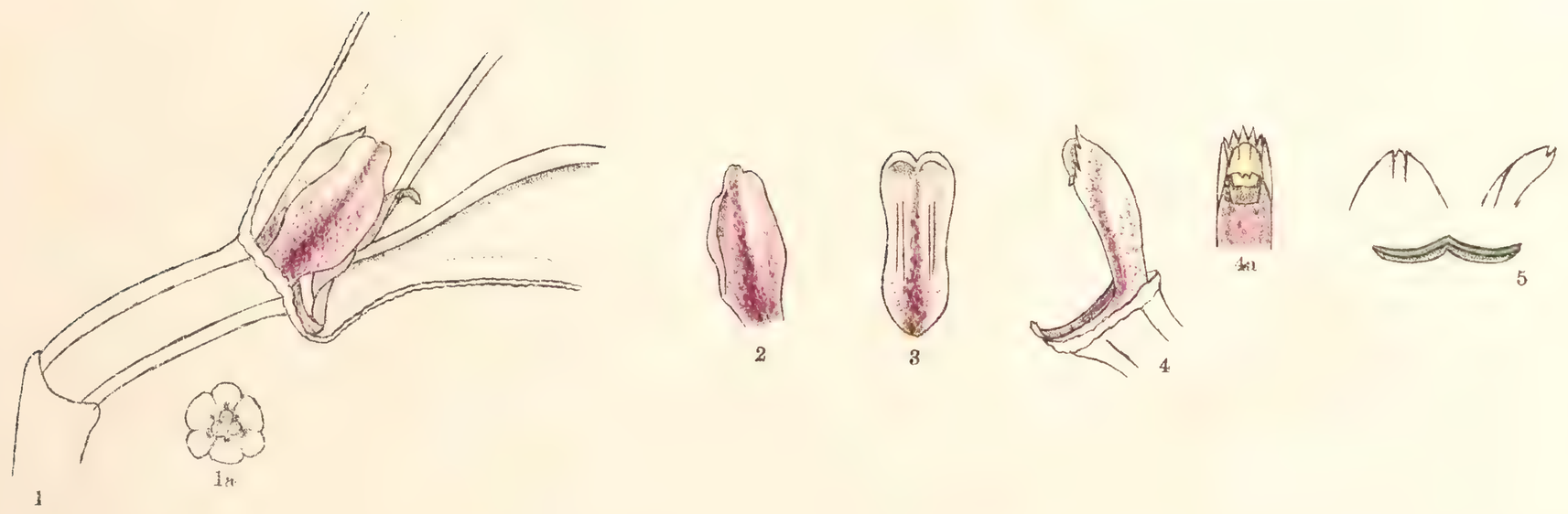
Lip a little longer than the petals, oblong-pandurate, with two longitudinal angled keels, base thick, grooved, united to the curved foot of the column by a flexible hinge, apex recurved, dull crimson-brown, the keels paler.

Column nearly as long as the petals, curved, very narrowly winged, white, foot crimson, apex very minutely crenate.

IMPORTED from the mountains of Costa Rica by Messrs. Shuttleworth and Carder, of Clapham, about the year 1886, with no record of its exact habitat.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size*.



Florence H. Woolward del et lith. 1896.

Goater, Imp.

MASDEVALLIA FULVESCENS *Rolfe*.

MASDEVALLIA FULVESCENS Rolfe.

MASDEVALLIA FULVESCENS Rolfe. Gard. Chron. 1890, pt. II., p. 325, fig. 65.

Leaf about 4 inches long, oblong-lanceolote, carinate at the back, apex tridenticulate, narrowing below into a slender grooved petiole, sheathed at the base, bright green.

Peduncle 3 inches long, terete, slender, erect from within the sheath at the base of the petiole, pale green; bract ½ inch long, membranous, ovate, apiculate, sheathing below, with a minute rudimentary bud within at the base, pale green.

Ovary ¼ inch long, with six rounded angles, pale green.

Sepals: dorsal sepal united to the lateral sepals for nearly ½ inch, forming a narrow tube, free portion broadly triangular for nearly ¼ inch, cucullate, 3-nerved, dull orange-yellow shaded with reddish-crimson, terminating in a slender, waved, flattened tail 2½ or 3 inches long, bright orange, pale greenish-yellow at the base; lateral sepals cohering for about 1 inch, oblong-triangular, with three prominent nerves, the spaces between hollowed inwards, white, shaded with pale rose-pink and yellow, tapering into slender, waved, flattened tails about 2 inches long, bright orange, pale greenish-yellow at the base.

Petals scarcely ¼ inch long, oblong, very thick and fleshy, margins waved, anterior margin much thickened, pale pink, with a few small rose-pink spots and a darker central stripe.

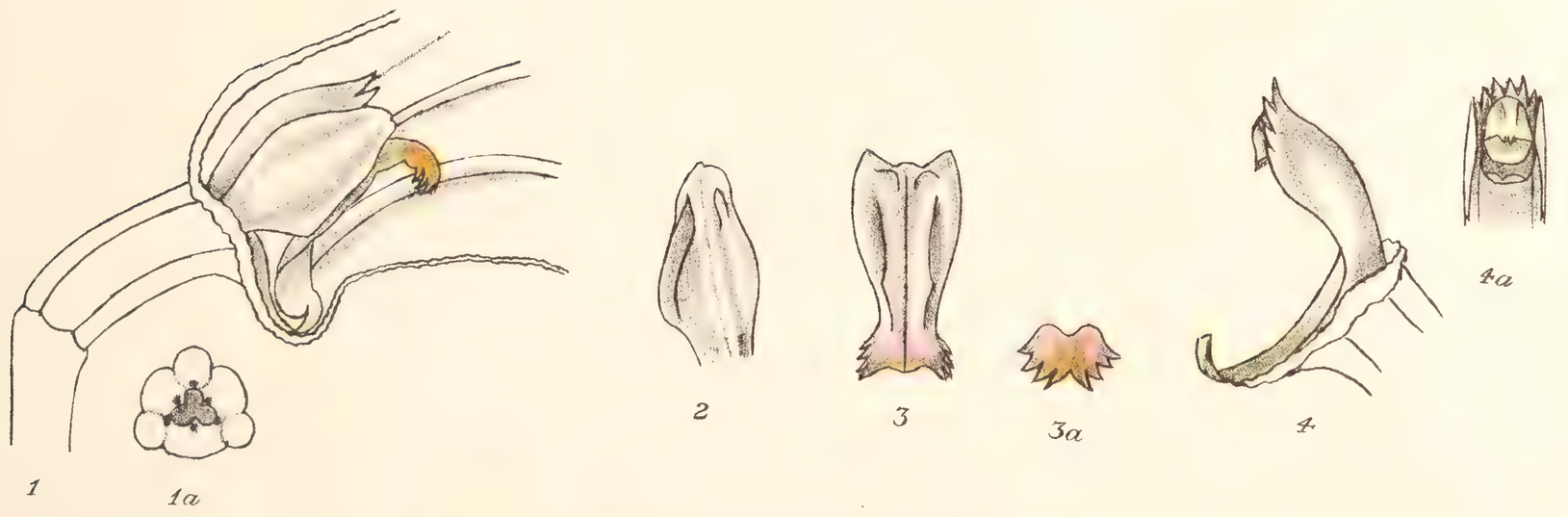
Lip a little longer than the petals, fleshy at the base and united by a hinge to the foot of the column, oblong, with two small longitudinal keels near the centre, apex recurved, very pale pink, with a darker stripe and a few spots near the apex.

Column a little shorter than the petals, narrowly winged, apex denticulate, white, with rose-pink spots.

MASDEVALLIA FULVESCENS was imported from Colombia, in 1890, by Messrs. F. Horsman and Co., of Colchester, and there is no further record of its habitat. It is closely allied to, if not identical with, *M. Schroederiana*, which is, however, so much more beautiful that I have figured it in a separate Plate, treating it—until some more competent botanist shall decide the question—as a distinct species.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.



Florence H. Woolward del et lith. 1896

Goater, Imp.

MASDEVALLIA MARGINELLA *Rchb. f.*

MASDEVALLIA MARGINELLA Rchb. f.

MASDEVALLIA MARGINELLA Rchb. f. Gard. Chron. 1883, pt. II., p. 38; Orchidophile (Godefroy) 1883, p. 695.

M. Costaricensis Rolfe, Gard. Chron. 1890, pt. II., p. 183.

Leaf about 4 inches long, obovate-spathulate, tridenticulate, narrowing below into a slender grooved petiole, sheathed at the base, bright green.

Peduncle 3 or 4 inches long, terete, slender, attenuate below, 1 or 2-flowered, ascending from the base of the petiole, with one or two sheathing bracts, pale green; flowering bracts about $\frac{1}{2}$ inch long, oblong-ovate, membranous, apiculate, sheathing below, dull brownish-green.

Ovary $\frac{1}{4}$ inch long, with six rounded angles, shining green.

Sepals: dorsal sepal united to the lateral sepals for $\frac{1}{2}$ inch, forming a narrow compressed tube, gibbous below, free portion very small, triangular, 3-nerved, whitish, tapering into a slender terete tail about $1\frac{1}{2}$ inch long, green at the base and back, brilliant orange-scarlet in the front; lateral sepals cohering for nearly $\frac{3}{4}$ inch, broadly ovate-triangular, 3-nerved, all the central nerves carinate on the outer surface, whitish, with a short central streak of pale yellow, and terminating in slender terete tails about $1\frac{1}{4}$ inch long, pale green at the base, front orange-yellow, nerves green.

Petals $\frac{1}{4}$ inch long, oblong-ovate, thickened on the anterior margin, with a small rounded projection on the opposite side, white.

Lip a little longer than the petals, wide at the base and united by a hinge to the curved foot of the column, margins recurved, with two angled longitudinal keels near the centre, white, apex much recurved, pink and yellow, margins dentate.

Column equalling the petals, winged, apex acutely denticulate, white, foot pale yellow.

MASDEVALLIA MARGINELLA was imported by Messrs. Sander, of St. Albans, about the year 1882, from the Mountains of Costa Rica. It grows with *M. Reichenbachiana* and *M. calura*, to both of which plants it is closely allied. In 1890 it was again described, as a new species, by Mr. R. A. Rolfe, of the Royal Herbarium, Kew, under the name *M. Costaricensis*, from specimens in the collection of Mr. Sydney Courtauld.

In separating *M. marginella* from the *Coriaceæ*, with which Reichenbach classed it, I am not differing altogether from his opinion, for, in his account of *M. Reichenbachiana*, Gard. Chron. 1875, pt. II., p. 257, he says of that species: "This interesting Masdevallia one might introduce as belonging to the Coriaceæ group, provided one does not think it better to make of it a new group, on account of its funnel-shaped tube, narrowed at the base, very slender tails, and thin texture."

There can be no doubt of the affinity between *M. marginella* and *M. Reichenbachiana*, and they must therefore be classed together, with others also closely allied, such as *M. calura*, *M. Rolfeana*, &c. Several of the species included in this group were not introduced until after Reichenbach's death, in 1889, and had he known them all he would probably have classed them in a new Section. His words, quoted above, well describe the differences between flowers of this Section and those of the *Coriaceæ*. The leaves differ chiefly in being more slender in the petiole, less rigid, and wider in proportion to their length. These characteristics will be well seen by comparing the leaves of *M. leontoglossa* with those of *M. marginella*.

Explanation of Plate:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, apex of lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

1a 2 3 4 4a 5

Florence H. Woolward del. et lith. 1890.

MASDEVALLIA REICHENBACHIANA *Endres.*

M&N. Hanhart imp.

MASDEVALLIA REICHENBACHIANA Endres.

MASDEVALLIA REICHENBACHIANA Endres in Gard. Chron. 1875, pt. II., p. 257 ; 1879, pt. I., p. 559 ; 1881, pt. II., p. 336 ; 1883. pt. II., p. 360 *(var. aurantiaca* Rchb. f.) ; Orchidophile (Godefroy), vol. I. (1881), p. 97 ; Veitch Manual Orch. pt. V. (1889), p. 60 ; Lindenia vol. VI. (1890), p. 23, pl. CCL.

M. Normanni hort., *syn. fide* Rchb. f. Gard. Chron. 1881, pt. II., p. 230.

Leaf 4 or 5 inches long, $\frac{3}{4}$ or 1 inch wide, oblanceolate, carinate, tridenticulate, narrowing below into a grooved petiole, sheathed at the base, bright green, the two principal nerves paler.

Peduncle 6 or 7 inches long, terete, ascending from within a sheath at the base of the petiole, 1 to 3-flowered, bright green ; bract about $\frac{1}{2}$ inch long, sheathing below, ovate-apiculate above, bright green.

Ovary about $\frac{1}{4}$ inch long, with six rounded angles, dark brown or greenish.

Sepals : dorsal sepal united to the lateral sepals for about 1 inch, forming a wide tube, free portion triangular for about $\frac{3}{8}$ inch, 3-nerved, inner surface pale yellow with red nerves, outer surface rich dark red or claret-crimson, almost scarlet at the base, tapering into a slender recurved tail about 2 inches long, greenish-yellow ; lateral sepals cohering for $1\frac{1}{4}$ inch, triangular-ovate, 3-nerved, nerves bifurcating and strongly carinate, inner surface pale lemon-yellow or pearly pink, tinged with red near the outer margin, outer surface pale yellow, crimson, and red, tails $1\frac{1}{2}$ inch long, slender, pale green.

Petals $\frac{1}{4}$ inch long, oblong-ovate, anterior margin much thickened, ivory-white.

Lip $\frac{1}{4}$ inch long, oblong-pandurate, with two short longitudinal keels, ivory-white, apex narrow, recurved, pale yellow.

Column $\frac{1}{4}$ inch long, winged, ivory-white, apex denticulate, pale yellow.

MASDEVALLIA REICHENBACHIANA was discovered in 1873 in the mountains of Costa Rica, by Endres, who named it in honour of Professor Reichenbach. Imported plants first flowered at Little Stanmore, Middlesex, in 1875, in the collection of the Rev. J. B. Norman, who, under the impression that the plant was a new species, named it *M. Normanni.*

The flowers vary greatly in colour, the outer surface being sometimes of so dark a shade of red as to appear almost black, and sometimes of every shade of crimson or purplish-red. The inner surface of the flowers is of an extremely delicate shade of pearly pink, the effect of the deep colour of the outer surface seen through the semi-transparent tissues of the sepals. The flowers last a long time in perfection, a second and even a third flower expanding before the first fades.

In the variety named *aurantiaca* by Professor Reichenbach, the dark red is replaced by rich orange.

Explanation of Plate, drawn from a Plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf ; *natural size.*

Of the habitat of this species Consul Lehmann gives more detailed information than any hitherto published :

M. Reichenbachiana is distributed over the Central Cordillera of Costa Rica, between the Vulcan de Barba and the Pico Blanco, at an elevation of 1,600 to 2,200 mètres (5,200 to 7,150 feet). It grows on trees in dense and damp woods, in an average summer temperature of 17° to 19° Centigrade (about 62° to 66° Fahrenheit), and an average winter temperature of 15°.5 to 17°.5 Centigrade (about 60° to 63° Fahrenheit).

I first observed it in 1878, on the western slopes of the Vulcan Frazú near San Isidro; also on the mountain range between Cartago and San Pedro; on the mountains between Desamparados and San Cristobal; and in the Montaña Dota. From these localities I sent a few living plants to Messrs. Hugh Low & Co., of Clapton. The first large consignment of living plants was sent by me to Messrs. Sander, of St. Albans, in 1882, with plants of *M. calura* and *M. erythrochœte*, from the same localities.

F. C. LEHMANN.

Florence H.Woolward del.et lith. 1893.

M&N.Hanhart imp.

MASDEVALLIA ROLFEANA *Kränz*.

MASDEVALLIA ROLFEANA Kränz.

Masdevallia Rolfeana Kränz. Gard. Chron. 1891, pt. I., p. 488.

Leaf about 5 inches long and $\frac{3}{4}$ inch wide, obovate, thick and fleshy, carinate at the back, apex obtusely tridenticulate, dark shining green, narrowing below into a slender grooved pale green petiole, sheathed at the base.

Peduncle, including pedicel, about 3 inches long, terete, slender, ascending from within a sheath at the base of the petiole, bright green ; bract $\frac{1}{2}$ inch long, ovate, apiculate, brownish, sheathing below, with a minute rudimentary bud within at the base.

Ovary $\frac{1}{4}$ inch long, with six rounded angles, pale green.

Sepals : dorsal sepal united to the lateral sepals for nearly $\frac{1}{2}$ inch, forming a wide tube, yellow at the base, free portion about $\frac{3}{8}$ inch long, ovate-triangular, cucullate, 3-nerved, dark claret-crimson, terminating in a slender green and yellow tail about $1\frac{1}{2}$ inch long ; lateral sepals cohering for nearly 1 inch, oblong-oval, 3-nerved, purplish-crimson, terminating in slender tails about $1\frac{1}{4}$ inch long, yellow and green.

Petals about $\frac{1}{4}$ inch long, linear at the base, oblong-oval, apiculate, thick and fleshy, with an obtuse keel on the anterior margin, dark purplish-crimson, paler towards the apex.

Lip a little longer than the petals, oblong, apiculate, fleshy at the base and united to the curved foot of the column by a flexible hinge, with two lateral longitudinal keels, pinkish, with brighter spots, apex fleshy, recurved, crimson.

Column a little longer than the petals, narrowly winged, white, apex denticulate.

MASDEVALLIA ROLFEANA was first described by Dr. F. Kränzlin in 1891. It was imported by Mr. F. Sander, with other species of the same section, from the Central Cordillera of Costa Rica.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size*.

Florence H. Woolward del et lith. 1896

Goater Imp.

MASDEVALLIA SCHROEDERIANA *hort.*

MASDEVALLIA SCHROEDERIANA Hort.

MASDEVALLIA SCHROEDERIANA, Hort. Sander, 1890.

Leaf 5 or 6 inches long, oblong-lanceolate, carinate at the back, apex tridenticulate, narrowing below into a slender grooved petiole, sheathed at the base, bright green.

Peduncle 7 or 8 inches long, terete, slender, erect from within the sheath at the base of the petiole, pale green ; bract about $\frac{3}{4}$ inch long, membranous, ovate, apiculate, sheathing below, with a minute rudimentary bud within at the base, pale green.

Ovary $\frac{3}{8}$ inch long, with six rounded angles, pale green.

Sepals : dorsal sepal united to the lateral sepals for $\frac{3}{4}$ inch, forming a narrow tube, free portion broadly triangular for nearly $\frac{1}{4}$ inch, cucullate, 3-nerved, rich orange-yellow shaded with crimson, with two dark crimson spots, terminating in a slender tail about 2 inches long, rich orange, pale greenish-yellow at the base ; lateral sepals cohering for more than 1 inch, oblong-triangular, 3-nerved, the nerves prominent, the spaces between hollowed inwards, white, with a broad border of rose-crimson on the outer margin, terminating in slender tails about $1\frac{3}{4}$ inches long, rich orange, pale greenish-yellow at the base.

Petals $\frac{1}{4}$ inch long, oblong, very thick and fleshy, margins waved, pale pink, with rose-coloured spots and a darker central stripe.

Lip a little longer than the petals, fleshy at the base and united to the foot of the column by a hinge, oblong, with two small longitudinal keels near the centre, apex recurved, pale pink, with a few darker spots and a central line near the apex.

Column a little shorter than the petals, narrowly winged, apex denticulate, white, with pink spots.

AS a botanical species there seems no reason to separate *Masdevallia Schroederiana* from *M. fulvescens*, intermediate forms, one of which is shown at fig. 6 of the accompanying Plate, connecting the two very closely. The structure of the two plants is remarkably alike, and a description of one would apply equally well to the other, differences occurring only in size and in richness of colouring. Unfortunately, no botanical description of *M. Schroederiana* was published at the time of its first appearance in Mr. Sander's collection, although it was, and still is, advertised in his catalogue under this name. The Orchid Committee of the Royal Horticultural Society awarded a First-class Certificate, July 8th, 1890, to a plant then shown in flower by Baron Schroeder, whose name it bears, but it was not until September of the same year that Mr. Rolfe named and described *M. fulvescens* in the "Gardeners' Chronicle." The name *M. Schroederiana* has therefore the priority, although the plant was not botanically described, and it is to be regretted that this, the first introduced and finest form of the species, should not be considered the type. I have therefore decided to give a separate Plate of extreme forms of this plant, leaving it for future decision whether they should be considered distinct, or merely varieties of one species. Its habitat and discoverer are unknown.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, apex of lip ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf ;—6, variety ; *natural size*.

SECTION XI.

SACCOLABIATÆ Rchb. f.

A MOST distinct Section, differing so essentially from the type of *Masdevallia*, that Reichenbach would have been justified in forming it into another Genus, a course which he appears to have at one time contemplated. Many of the plants included in it are so extremely variable, and have in consequence received so many names, that it is difficult to decide which are species and which varieties.

12 species and two varieties figured :

Masdevallia bella Rchb. f.
Carderi Rchb. f.
Chestertonii Rchb. f. (=*M. macrochila Regel.*)
Chimæra Rchb. f.
Chimæra var. Backhousiana.
Chimæra var. Roezlii.
erythrochæte Rchb. f. (=*M. astuta Rchb. f. et M. Gaskelliana Rchb. f.*)
Houtteana Rchb. f. (=*M. Benedicti Rchb. f. et M. psittacina Rchb. f.*)
nycterina Rchb f.
pusilla Rolfe.
radiosa Rchb. f.
trinema Rchb. f. (=*M. Lowii Rolfe.*)
Troglodytes Rchb. f.
Vespertilio Rchb. f.

Varieties of M. Chimæra not figured in this work :

M. Chimæra var. Burbidgeana Rolfe Orch. Rev. 1893, p. 265.
dolosa Rchb. f. MS.
Gorgona Lind. Cat. 1873.
senilis Rchb. f. Gard. Chron. 1885, pt. II., p. 489.
severa Rchb. f. Gard. Chron. 1875, pt. I., p. 170.
splendida, hort.
Wallisii Rchb. f. Gard. Chron. 1875, pt. I., p. 258.
Winniana Rchb. f. Gard. Chron. 1881, pt. II., p. 195.

Not in cultivation :

M. microglochin Rchb. f. Flora (Singer), 1886, p. 558.
platycrater Rchb. f. Flora (Singer), 1886, p. 559.
Spectrum Rchb. f. Gard. Chron. 1875, pt. I., p. 429.
Tubeana Rchb. f. Gard. Chron. 1878, pt. I., p. 234.

Florence H. Woolward del. et lith. 1889.

Hanhart imp.

MASDEVALLIA BELLA *Rchb. f.*

MASDEVALLIA BELLA Rchb. f.

Masdevallia bella Rchb. f. Gard. Chron. 1878, pt. I., p. 725; 1880, pt. I., p. 760, fig. 131 p. 756, and fig. 132 p. 757; 1881, pt. II., p. 236, fig. 50, and p. 846; Floral Mag. 1881, n. ser., t. 433; Belgique Horticole, 1884, vol. XXXIV. p. 57, t. 3.

Leaf 6 or 8 inches long, and about 1 inch broad, oblong-lanceolate, sharply tridenticulate, carinate, bright green, narrowing into a slender, deeply-grooved, pale-green petiole, sheathed at the base.

Peduncle 6 or 7 inches long, attenuate towards the base, terete, jointed, with a sheathing bract at each joint, dark purple, or dull green shaded with purple, descending from the base of the petiole; flowering bract about $\frac{1}{2}$ inch long, with several nerves, carinate, apiculate, pale green shaded with purple or crimson.

Ovary about $\frac{1}{4}$ inch long, attenuate near the base, with six crenate wings, green and purple.

Sepals: dorsal sepal united to the lateral sepals for nearly $\frac{1}{2}$ inch, 7-nerved, triangular for 1 inch or more, tapering into a slender tail $3\frac{1}{2}$ inches long; lateral sepals cohering for about 1 inch, 7-nerved, ovate, tapering into slender tails 3 inches long, sometimes curved inwards so as to cross each other; all sepals pale yellow, bordered and spotted with crimson, and covered with short thick hairs, inner half of the lateral sepals scarcely spotted; tails all purple-crimson.

Petals $\frac{1}{4}$ inch long, linear at the base, angled on both margins, cleft at the apex, outwardly broadly winged, inwardly triangular and denticulate, bright yellow spotted with rust-red, outer wing with numerous radiating lines of minute papillæ.

Lip about $\frac{1}{2}$ inch long, and $\frac{3}{4}$ inch broad, with a slender, fleshy, deeply-grooved claw, united by a delicate hinge to the base of the column, reniform and concave, with numerous radiating and bifurcating keels, white with pale pink spots upon the claw.

Column about $\frac{1}{8}$ inch long, thick, curved, rust-red, pink at the base, apex minutely denticulate.

MASDEVALLIA BELLA is one of the most curious of the genus, and may be distinguished from all other species by the delicate whiteness of the shell-like lip, and the rounded, wide-spreading yellow wings of the petals. Unlike most species allied to it, *M. bella* apparently produces only one flower from each stem. It was discovered in 1873 by Gustav Wallis, in the mountains of Antioquia, and his dried specimens were sent to Professor Reichenbach, who, however, published his first description of the species from other specimens, collected in 1878 by Boxall. The first living flowers seen in Europe were in the collection of Herr Wendland, at Hamburgh.

We are indebted to Consul Lehmann for the following information :

Masdevallia bella has but a limited geographical distribution, having been hitherto observed only in the vicinity of Frontino and Urrao, on the western declivities of the Western Cordilleras of Antioquia. It grows on trees, and also on the ground, in damp and shady woods, at an elevation of 1,600 to 2,200 mètres (5,200 to 7,150 feet), and flowers in October and November. The annual average temperature of the whole region ranges from 15°·9 to 19°·4 Centigrade (about 60° to 67° Fahrenheit). The atmosphere in the entire region is highly saturated with moisture nearly the whole year round. The driest months of the year are January to March, and July and August, during which the average humidity is 75° per cent. ; while for the rest of the year the average is 86° per cent.

F. C. LEHMANN.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, front of lip, *both slightly enlarged ;*—2, section of ovary ;—3, petal, inner side ;—4, column ;—4a, apex of column, *all much enlarged ;*—5, apex and section of leaf, *natural size.*

Florence H. Woolward. del. et lith. 1891.

M&N. Hanhart imp.

MASDEVALLIA CARDERI *Rchb. f.*

MASDEVALLIA CARDERI Rchb. f.

MASDEVALLIA CARDERI Rchb. f. Gard. Chron. 1883, pt. I., p. 784 ; pt. II., p. 181, fig. 30 ; 1884, pt. I., p. 741, *in group* fig. 141 ; 1890, pt. II., p. 76 ; Orchidophile (Godefroy) 1883, p. 397 ; Veitch Manual Orch. pt. V. (1889), p. 27 ; Bot. Mag. t. 7125 (1890).

Leaf 4 or 5 inches long, oblong-lanceolate, carinate at the back, apex tridenticulate, bright green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle 2 or 3 inches long, descending or lateral from the base of the petiole, terete, slender, with numerous small sheathing apiculate bracts, dark green and crimson ; flowering bract about $\frac{3}{8}$ inch long, oblong-ovate, carinate, apiculate, 3-nerved, sheathing, pale green.

Ovary nearly $\frac{1}{4}$ inch long, crimson, with six crenate green wings.

Sepals cohering equally for about $\frac{1}{2}$ inch, campanulate, free portion triangular-ovate for nearly $\frac{3}{8}$ inch, the principal nerves carinate, white tinged with pale yellow, spotted externally with purplish-crimson, the internal surface closely covered with short red-brown hairs, and having a few small purple spots, each sepal terminating in very slender tails about 1 inch long, yellow with small crimson spots.

Petals about $\frac{1}{8}$ inch long, oblong-ovate, cleft at the apex, with minute papillæ within the cleft, yellowish, with red-brown spots and papillæ.

Lip about $\frac{1}{4}$ inch long, fleshy at the base and deeply cleft, united to the foot of the column by a flexible hinge, anterior portion concave, shell-like, with a fleshy central keel, pure white.

Column $\frac{1}{8}$ inch long, winged, apex denticulate, white, tinged with reddish-brown.

MASDEVALLIA CARDERI was first described by Professor Reichenbach in 1883, from specimens found by Carder near Frontino, in the Western Cordillera of Colombia, and his plants were the first to flower in cultivation, in the establishment of Messrs. Shuttleworth and Carder, at Clapham.

Professor Reichenbach had previously received dried flowers of this species from Consul F. C. Lehmann, who discovered it in November, 1877, and it is impossible to say why he published no description of these, the first specimens ever sent to Europe.

The plant represented in the accompanying Plate is the variety with long slender tails, most common in cultivation. Fig. 6 of the same Plate represents the rarer variety with short blunt tails, and was drawn from a flower sent to me in June, 1889, by Mr. F. W. Moore, Director of the Royal Botanic Gardens, Glasnevin, Dublin.

I am informed by Consul Lehmann that the leaves of the wild plants having thick and short-tailed flowers, differ from those of the slender long-tailed variety in being

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Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig, 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, petal, side view ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size ;*—6, flower of short-tailed variety, *natural size.*

longer, thicker, and more acuminate, while the flowers are of thicker texture and more tubular. These characteristics I find to be also present in cultivated plants. The two forms can only be regarded as local varieties, their variation probably accounted for by the different elevation and temperature of the localities in which they grow.

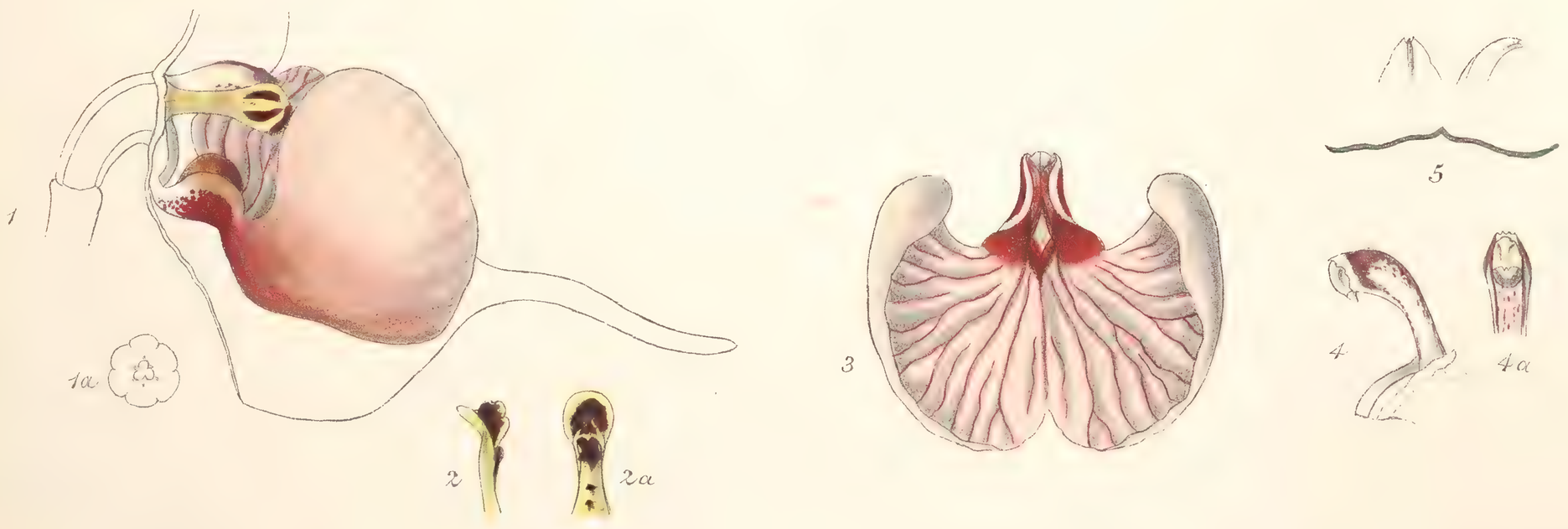
I have received the following note from Consul Lehmann :

The variety of *Masdevallia Carderi* with long slender tails comes from the neighbourhood of the Rio Dagua, in the Western Andes of Cali, in the State of Cauca, Colombia, where it grows on trees in dense, very damp woods at an elevation of 400 to 800 mètres (1,300 to 2,600 feet), in a temperature of 24° and 25° Centigrade (about 75° to 77° Fahrenheit).

The short-tailed variety is found in Antioquia, where it grows on trees in dense shrubby woods on the Iracál and Musinga mountains between Dabeiba and Frontino, at a greater elevation, 800 to 1,400 mètres (2,600 to 4,550 feet) ; and in a lower temperature, only 21° to 22° Centigrade (about 69° to 71° Fahrenheit).

The climate of both localities is very damp, and the rainfall is profuse and constant. There is no really dry season in these regions, but during the months of July and August, and of January and February, the rains are not so heavy and frequent as during the other months of the year.

In a wild state *M. Carderi* flowers from October until December, and during May and June.



Florence H.Woolward. del et lith. 1889.

M&N. Hanhart imp.

MASDEVALLIA CHESTERTONII *Rchb. f.*

MASDEVALLIA CHESTERTONII Rchb. f.

Masdevallia Chestertonii Rchb. f. Gard. Chron. 1883, pt. I., p. 532; Orchidophile (Godefroy) vol. I. (1883), p. 623; Bot. Mag. 6977.

Leaf 5 or 6 inches long, 1 or 1¼ inch wide, oblong, carinate, acutely tridenticulate, bright green, narrowing into a slender, grooved, pale green petiole, with wide membranous sheaths at the base.

Peduncle 3 or 4 inches long, horizontal, or descending from the base of the petiole, terete, with numerous sheathing bracts, dull green sometimes marked with purple; producing two or three flowers, each flower falling off before the expansion of the next; flowering bract about ¼ inch long, 3-nerved, apiculate, carinate, light green.

Ovary ¼ inch long, terete, with six grooves, curved, dull green or purple.

Sepals: dorsal sepal united to the lateral sepals for ¼ inch, oblong-ovate for about ¾ inch, 7-nerved, erect, margins reflexed; lateral sepals cohering for nearly ¾ inch, roundly ovate, 7-nerved; all pale green, spotted with dark purple, and with numerous small purple papillæ, and terminating in slender flattened tails about ¾ inch long, dark purple or greenish.

Petals nearly ¼ inch long, yellow with dark brown spots, linear at the base, diverging at the apex into two wings, the outer rounded, the inner triangular, having between them an angled wart-shaped process, dark brown and shining.

Lip about 1 inch wide, with a long claw, concave in the centre, with a fleshy lobe on each side, united by a hinge to the foot of the column, anterior portion reniform, with a prominent reddish central keel and numerous radiating ones, which bifurcate near the margin, flesh-pink, shaded with deep rust-red.

Column ¼ inch long, much curved, narrowly winged, white or very pale green spotted with crimson, apex minutely denticulate.

I AM informed by Consul Lehmann that *Masdevallia Chestertonii* was discovered in 1879, on the western slopes of the Farrallones de Cali, in the State of Cauca, by Chesterton, who was sent out to collect Orchids by Messrs. Sander, of St. Albans. A later date and a different locality are usually assigned to it. The colour of the flowers varies in different specimens, some being green with crimson-purple spots, and others yellowish with blackish-purple spots. The shell-like lip, resembling in shape that of *M. bella*, is sometimes a delicate pink, sometimes pale pinkish-yellow, more or less shaded and veined with deep red. The petals differ remarkably from those of *M. bella*, its nearest ally, having at their apex a thick, shining, dark-brown knob, instead of the spreading yellow wings so characteristic of that species.

The following information is added by Consul Lehmann :

Masdevallia Chestertonii grows on trees, and sometimes also on the ground, in dense and very damp woods on the western slopes of the Farrallones de Cali, in the department of the Cauca, at an elevation of 1,800 to 2,200 mètres (5,850 to 7,150 feet). It is also found on the Cerro de Calima, west of Buga, and above Anserma Nueva and the Arrayal ; but it does not extend into Antioquia. It flowers in April and May, and also in October and November. The annual average temperature of the region is between 16° and 18° Centigrade (60°·8 to 64°·4 Fahrenheit).

F. C. LEHMANN.

Explanation of Plate, drawn from à plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—2, side of petal ;—2a, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size.*

MASDEVALLIA CHIMÆRA *Rchb. f.*

ence H Woolward del et lith. 1893.

M&N. Hanhart imp.

MASDEVALLIA CHIMÆRA Rchb. f.

MASDEVALLIA CHIMÆRA Rchb. f. Gard. Chron. 1872, p. 463 ; 1875, pt. I., p. 40, fig. 5 ; pt. II., pp. 233 and 258 ; 1881, pt. I., p. 463 ; pt. II., p. 112, fig. 26, also p. 236 ; 1884, pt. I., p. 736, *in group* fig. 141, p. 741 ; Florist and Pomol. 1873, p. 2; Belg. Hort. XXIII. (1873), p. 355 ; XXV. (1875), p. 320 ; XXVI. (1876), p. 116 ; XXXII. (1882), p. 313, t. XIII. ; Illustr. Hort. 1873, p. 25, t. 117-118 *(M. nycterina)* ; Xen. Orch. II. (1874), p. 195, t. 185 and 186, fig. I. ; Bot. Mag. t. 6152 (1875) ; Floral Mag. n. s. 1875, t. 149 ; Linnæa XLI. (1877), p. 8 ; De Puydt, Les Orch. (1880), p. 285, pl. XXIII. *(M. nycterina)* ; Revue Hort. 1881, p. 130, with fig. ; Orchidophile (Godefroy), vol. I. (1881-3), p. 78, with fig. ; Orch. Album (Warn. et Will.), V. (1886), t. 203 ; Gartenflora (Regel), 1889, p. 617, t. 1311 ; Veitch Manual Orch. pt. V. (1889), p. 30.

Leaf 8 or 10 inches long and $1\frac{1}{2}$ to 2 inches wide, oblanceolate, sometimes plicate, carinate at the back, apex acutely tridenticulate, bright green, narrowing below into a pale green petiole with brown membranous sheaths at the base.

Peduncle 9 to 18 inches long, terete, wiry, erect, lateral, or descending from the base of the petiole, dark green or dull purple, with many appressed bracts, flowers two to six, opening in succession, each falling off before the expansion of the next, the peduncle lengthening as each bud developes, flowering bracts oblong-ovate, acutely apiculate, sheathing below, bright green.

Ovary about $\frac{3}{8}$ inch long, with six rounded angles, dull green or purplish.

Sepals: dorsal sepal united to the lateral sepals for nearly $\frac{1}{2}$ inch; lateral sepals cohering for about $1\frac{1}{2}$ inch, deeply curved at the back ; all ovate for 2 or $2\frac{1}{2}$ inches and terminating in slender tapering dark purple tails 4 to 10 inches long ; many-nerved, central nerves prominent on the outer side ; various shades of primrose, cream, or ochre yellow ; stained and spotted with crimson-purple, more or less bright, and thickly studded with coarse tapering hairs, the spots and hairs becoming very small near the centre.

Petals $\frac{3}{16}$ inch long, spathulate, the apex divided into two rounded lobes, between which is a mass of shining papillæ, white and crimson or purple.

Lip about $\frac{3}{4}$ inch long, the basal part fleshy, grooved, shining, united to the foot of the column by a flexible hinge, the anterior part saccate, with one or three central longitudinal keels, more or less prominent, with numerous rays diverging towards the margin, where they terminate in strong incurved teeth ; white, pinkish, or pale yellow, more or less tinged and shaded with rust-colour.

Column rather longer than the petals, pale yellow or whitish, apex minutely denticulate, foot pale pink.

MASDEVALLIA CHIMÆRA was discovered in March 1870, by Roezl, at Choco, in the Western Andes of Colombia, 7,400 feet above the level of the sea, and from one badly dried flower and a coloured sketch sent by him, Professor Reichenbach named the plant. No living specimens were introduced until some time afterwards, the first which flowered in cultivation being apparently those sent to Reichenbach by Mr. Bull

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Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, side of petal ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf ; —6, ripe seed-capsule from wild plant ; *natural size.*

in 1875. Both Roezl and Wallis, while collecting *M. Chimæra*, observed its extreme variability, but although several varieties sent home by them received specific names from Reichenbach, he seems never to have quite decided whether to treat them as distinct species, or as forms of the original *M. Chimæra* of Roezl. The varieties now in cultivation are so numerous that they form a tolerably consecutive series, and it is well known that throughout the vast geographical range of the species many other varieties exist, a fact which sets at rest all doubt as to the polymorphous character of the plant.

In order to realise the wonderful variation of *M. Chimæra*, anyone interested in the subject could not do better than visit the rich collection brought together at Glasnevin, Dublin, by Mr. F. W. Moore, to whom I am indebted for many beautiful and curious varieties. It is proposed to figure in the present work a few of those best known in cultivation, and by dealing with each one separately, the number can be added to at any time. The plant here represented was imported by Mr. Bull, and was one of the first to flower in this country. The seed-capsule, fig. 6, was drawn from a specimen at the Natural History Museum, South Kensington, dried after the edges had split open and allowed the seeds to escape, thus showing the hair-like threads by which the seeds were attached to the inner surface of the capsule. The structure of every part of the flower presents interesting and peculiar characteristics, the uses of which in the life-history of the plant can only be surmised. The abundance of ripe seeds produced by wild plants of *M. Chimæra* seems to prove that some of the organs within the flower are effective in attracting insects, although there is no honey or other tempting fluid to act as a lure. The successive development of the flowers may possibly be designed as an additional means to ensure the production of seed; if one flower fails, another can be rapidly expanded, until all the buds have been developed, and every opportunity has been given for the appearance of the insect necessary to fertilise the seed. In a cultivated state, when the flowers have but a small chance of fertilisation by insects and therefore rarely produce seed, the stem goes on developing flower after flower in uninterrupted succession, each one fading and falling off before the expansion of the succeeding bud. This is shown in the accompanying Plate by the stem bearing one bud and four small stalks, from each of which both flower and seed-capsule have fallen. In the wild specimen shown at fig. 6, the second bud may be seen in quite an elementary stage of growth, the first flower having probably been fertilised by some insect, and the effort required by the plant to ripen the seed having temporarily arrested the growth of the next bud.

The following note is contributed by Consul Lehmann, whose botanical researches during a long residence among the mountains of Colombia entitle him to be considered the greatest authority upon the flora of that region.

Masdevallia Chimæra has a larger geographical distribution than any other species of its section, extending in an uninterrupted line from 0°30′ to 8° N. lat., or about 400 miles, along the western declivities of the Western Andes of Colombia. It is chiefly confined to the western slopes, but at the most northern limit of its range it is also found on the central mountains of the Departments of Bolivar and Antioquia. From 1,700 to 2,200 mètres (5,525 to 7,150 feet) above the level of the sea is the limit of its vertical range, and it occurs most frequently at just 2,000 mètres (6,500 feet). It grows in damp thick shady woods, chiefly on the ground, or upon the base of the trunks of large trees. Sometimes it is met with upon damp shady walls of rock, if they are not much covered with ferns or other vegetation. When found high up on trees, which is rarely the case, it chooses situations in which decayed leaves and mosses have accumulated. The climate of the whole region is very damp, and as there are very few days in the year without rain the atmosphere is almost saturated with moisture. The annual mean temperature ranges between 16° and 18°.5 Centigrade (about 60° to 65° Fahrenheit).

M. Chimæra varies very much in colour, form, and size, which might be considered the natural consequence of its very extensive geographical distribution had not actual observation proved that different varieties grow mixed together in nearly every locality, some having the ground colour of the flowers dull white, and others greenish yellow. The size of the flowers, however, differs much in each locality. At the northern limit of its range, the vicinity of La Bramadora, Briceño, and San Andres, the

flowers are smallest and the ground colour of the sepals is whitish, some pure white at the connection of the lateral sepals. The plants growing on the watershed of the Cordillera between Toyo and Cañasgordas, on the slopes of the Morrogacho and the Alto de las Alegrias near Abriaqui, and on the Cerro Plateado near Frontino, produce flowers of a good medium size. Their colour is here most variable. At Toyo there is a variety with flowers of a peculiar reddish colour stained with copper-brown and borne on stiff upright stalks. In the plants growing on the Cerro Plateado near Frontino, the flowers are tiger-like, thickly speckled (not blotched) with blackish-brown on a light yellow ground. From the Cerro de Caramanta, southwards by the Altos de Talmaná, and the Cerro de Calima as far as the Farallones de Cali, *M. Chimæra* grows mixed with *M. Chestertonii*. The variety growing here may be considered to be the type of the species, for it was near the latter place, on the Cordillera de San Antonio above Cali, that Roezl first met with it. Both the yellow and the whitish variety grow intermixed here. The latter as a rule produces the largest flowers, while the yellow form is more substantial and decidedly prettier. The largest flowered variety grows at a place called Bellavista, on a narrow rocky range of mountains projecting from the Cerro Munchique, in the Western Andes of Popayán, and running north-west towards Mencheque and Micay on the Pacific. The plants here grow chiefly on rocks among sphagnum moss, and bear upright flower-stalks, which often attain the length of 25 to 35 centimètres (about 10 to 14 inches), thus raising the flowers up above the leaves. Roezl's statement, that he found plants with flower-stalks two feet long, is an exaggeration. Near the frontier of Ecuador on the road from Tuquerres to Barbacoas, near the little village of Pususquer, there grows a variety with flowers streaked rather than blotched with blackish-brown, but the characteristic lip of the species remains unmodified. The plant here represented is found in the Western Andes of Cali, in Cauca.

Florence H. Woolward del. et lith. 1893.

MASDEVALLIA CHIMÆRA *Rchb. f.*, *var.* BACKHOUSIANA.

M&N. Hanhart imp.

MASDEVALLIA CHIMÆRA Rchb. f. var. BACKHOUSIANA.

Masdevallia Chimæra var. Backhouseana Veitch Manual Orch. pt. V. (1889) p. 30.

M. Backhousiana Rchb. f. Gard. Chron. 1879, pt. I., p. 716; pt. II., p. 114; 1881, pt. II., p. 236; Garden 1879, pt. I., pp. 442 and 455; Orchidophile (Godefroy) vol. I. (1881-3), p. 84; Reichenbachia vol. I. (1888), p. 43, t. 19.

THIS handsome variety of *M. Chimæra* was discovered in 1871, near Frontino in Antioquia, by Butler, a collector for Messrs. Backhouse of York, and it has also been found further south, on the Western Andes of Popayán. It was provisionally named by Professor Reichenbach as a distinct species, with the remark that if "connecting links" should appear between this and other forms of *M. Chimæra*, the plant must be regarded as merely a variety. Connecting links have indeed appeared in the shape of numerous forms and varieties of this most variable plant subsequently imported from many localities in the Western Cordilleras of Colombia.

The leaves of *var. Backhousiana* closely resemble those of *M. Chimæra*, but are rather narrower and less plicate. The sepals are usually rounder, paler, and less closely spotted, and the tails are comparatively short, the stems also being short and never erect. The rays within the lip—which, in this variety, is almost white—also show slight differences, but this characteristic does not appear to be constant, even in flowers from the same plant, and is not therefore of much value in distinguishing one variety from another. I am informed by Consul Lehmann that the plant here figured is found at Bramadora and Bricenio, in Antioquia, and that it is often much paler in colour.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—2a, side of petal;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

Florence H. Woolward del. et lith. 1889

MASDEVALLIA CHIMÆRA *Rchb. f., var.* ROEZLII .

Hanhart imp.

MASDEVALLIA CHIMÆRA Rchb. f. var. ROEZLII.

Masdevallia Chimæra var. Roezlii, Veitch Manual Orch. pt. V. (1889), p. 31.

M. Roezlii Rchb. f. Xen. Orch. II. (1874), p. 196, t. 186, fig. II.; Belg. Hort. 1875, p. 319; Linnæa XLI. (1877), p. 9; Gard. Chron. 1880, pt. II., p. 778; 1881, pt. II., p. 337; Lindenia vol. I. (1885), pl. XV., p. 35 (*non Rchb. f.*).

Sub-var. rubra Warn. et Will. Orch. Album vol. VI. (1887), t. 243.

THE habitat of *M. Chimæra var. Roezlii* is Frontino in Antioquia, on the slopes of the Cerro Plateado, and the Mucinga districts, and it was probably there that Roezl discovered it, although no exact locality is given by Professor Reichenbach in his first description from Roezl's specimens in 1874. It is the darkest in colour of all the varieties of *M. Chimæra*, the black-purple spots being suffused over almost the whole surface of the sepals. The most remarkable variation in *var. Roezlii* from the type is the absence of long hairs upon the sepals, these being replaced by numerous short warts or asperities. The lip is wider and shallower than in *M. Chimæra*, and pale pink with no tinge of yellow. It was probably these marked characteristics which led Professor Reichenbach to consider *M. Roezlii* a distinct species, while he admitted that his *M. Backhousiana* might ultimately prove to be only a variety. Sub-varieties of *var. Roezlii* are numerous, less spotted or paler in colour, the brightest being *sub-var. rubra*, in which the spots are chocolate-crimson instead of black.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position; 1a, section of ovary;—2, petal, side view;—2a, petal, inner side; 3, lip;—4, column;—4a, apex and section of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

Florence H. Woolward del et lith. 1896.

Goater, Imp.

MASDEVALLIA ERYTHROCHÆTE *Rchb. f.*

MASDEVALLIA ERYTHROCHÆTE Rchb. f.

MASDEVALLIA ERYTHROCHÆTE Rchb. f. Gard. Chron. 1882, pt. II., p. 392 ; Orchidophile (Godefroy) 1882, p. 423 ; Veitch Manual Orch. pt. V. (1889) p. 42.

Var. Gaskelliana=Masdevallia Gaskelliana Rchb. f. Gard. Chron. 1883, pt. II., p. 294 ; Orchidophile (Godefroy) 1884, p. 37 ; Veitch Manual Orch. pt. V. (1889), p. 44.

Var. astuta=Masdevallia astuta Rchb. f. Gard. Chron. 1886, pt. II., p. 584 ; Orchidophile (Godefroy) 1888, p. 354 ; Veitch Manual Orch. pt. V. (1889), p. 25.

Leaf 6 or 8 inches long, linear-lanceolate, carinate, acutely tridenticulate, bright green, narrowing below into a grooved petiole, sheathed at the base.

Peduncle about 5 inches long, terete, slender, jointed, with a sheathing apiculate bract at each joint, lateral or descending from the base of the petiole, with two or three flowers expanding in succession, dull purplish-green ; flowering bract about $\frac{3}{8}$ inch long, ovate-apiculate, sheathing below, pale green.

Ovary nearly $\frac{1}{4}$ inch long, curved, with six rounded angles, crimson-purple.

Sepals : dorsal sepal united to the lateral sepals for $\frac{1}{4}$ inch, forming a wide shallow cup, free portion triangular-ovate for about $\frac{1}{2}$ inch ; lateral sepals cohering for $\frac{1}{2}$ inch, rounded beneath, free portions triangular-ovate for more than $\frac{1}{2}$ inch ; all creamy white, tinged with yellow, and more or less spotted with crimson-purple, the inner surface covered with small elongated papillæ, with numerous nerves, of which the central ones are prominent on the outer surface, terminating in slender terete crimson-purple tails 1 or 2 inches long.

Petals about $\frac{1}{8}$ inch long, oblong, margins angled, apex bilobed, with a mass of minute dark-brown papillæ within the cleft, white or pale pink, with a few brown spots, apex yellowish.

Lip about $\frac{1}{2}$ inch long, curved and fleshy at the base, and united to the foot of the column by a very flexible hinge, deeply grooved, the anterior portion saccate, with three central keels and five or six smaller bifurcated keels radiating towards the toothed margin, very pale pink, sometimes nearly white, with a very few pale pink spots.

Column a little longer than the petals, narrowly winged, apex denticulate, pale yellow.

THE first specimens of *Masdevallia erythrochæte* were introduced from Central America by Mr. Sander, of St. Albans, in 1882. Numerous varieties are now known, and two of these were named by Reichenbach as distinct species—*M. astuta*, brought from Costa Rica by Carder, and *M. Gaskelliana*, a plant with smaller leaves and flowers, of which the habitat is unknown. One beautiful variety has much wider leaves than the plant here represented, and larger flowers, which are nearly white, delicately tinged with sulphur-yellow, and with only a few bright crimson spots, the tails being reddish-crimson and the lip pink. The accompanying woodcut is from a photograph of this variety.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, petal, side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size*.

Plants of *M. erythrochæte* with very long narrow leaves have been found in Costa Rica by Consul Lehmann, growing on the Candelaria Mountains, and very closely allied specimens have also been found by him in Antioquia. It is propably a species of wide geographical distribution, extending in varying forms from Costa Rica southwards into the Cordilleras of South America.

Florence H. Woolward del. et lith. 1893.

MASDEVALLIA HOUTTEANA *Rchb. f.*

M&N. Hanhart imp.

MASDEVALLIA HOUTTEANA Rchb. f.

Masdevallia Houtteana Rchb. f. Gard. Chron. 1874, pt. II., p. 98 (*July*); 1881, pt. II., p. 305; Flore des Serres vol. XX. (1874), p. 87, t. 2106; Veitch Manual Orch. pt. V. (1889), p. 45.

M. Benedicti Rchb. f. Xen. Orch. II. (1874), p. 197, t. 186, figs. III. and IV, (*December*); Linnæa XLI. (1877), p. 9; Gard. Chron. 1881, pt. II., p. 236.

M. psittacina Rchb. f. Gard. Chron. 1876, pt. I., p. 817; 1881, pt. II., p. 336.

Leaf 6 or 8 inches long and about $\frac{1}{2}$ inch wide, linear, carinate at the back, apex tridenticulate, bright green, the petiole very little narrower than the blade, pale green, sheathed at the base.

Peduncle, including pedicel, 4 or 5 inches long, terete, slender, descending or lateral from the base of the petiole, with numerous short apiculate sheathing bracts, dull green marked with dark purple; flowering bract about $\frac{1}{2}$ inch long, ovate, apiculate, sheathing below, with a minute bud within at the base, greenish.

Ovary about $\frac{3}{8}$ inch long, with six rounded angles, dull crimson.

Sepals: dorsal sepal united to the lateral sepals for about $\frac{1}{2}$ inch, forming a wide tube, free portion about $\frac{1}{2}$ inch long, ovate-triangular, 5-nerved; lateral sepals cohering for nearly 1 inch, free portions roundly triangular; all cream-colour tinged with yellow, with numerous small crimson spots and short thick hairs or papillæ, and terminating in dull crimson tails about $1\frac{3}{4}$ or 2 inches long.

Petals about $\frac{1}{8}$ inch long, oblong, angled on the margin, whitish, with crimson spots on the inner surface, apex bilobed, with a mass of minute papillæ between the lobes, outer lobe yellow, inner white.

Lip about $\frac{3}{8}$ inch long, curved and fleshy at the base, with a deep oval hollow in the centre, united to the foot of the column by a flexible hinge, rounded, shell-like, with a prominent central keel and several smaller radiating keels, sometimes bifurcating near the margin, pale shell-pink.

Column about $\frac{1}{8}$ inch long, white at the base, apex yellow, minutely denticulate or entire.

MASDEVALLIA HOUTTEANA was discovered by Roezl near Frontino in the Western Cordilleras of Antioquia, at an elevation of 8,000 feet, and his dried specimens were named by Professor Reichenbach in 1874. Like most of its allies, *M. Houtteana* is a variable species, and local varieties subsequently found by Roezl and other collectors, received from Reichenbach the specific names of *Benedicti* and *psittacina*.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—2a, petal, side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

They differ slightly from the type in the size and colouring of the flowers, and are no longer considered to be specifically distinct.

I am informed by Consul Lehmann that he has found this species near El Retiro, and also in damp woods between Itagni and Eliconia, in Antioquia, at an elevation of 1,800 to 2,300 mètres (5,850 to 7,475 feet). In a wild state it flowers twice in the year, during April and May, and again in October and November. It grows among copse or brush-wood, generally on the ground, but sometimes also on the mossy trunks of trees, the long narrow leaves forming very dense masses, from among which the flowers appear in great abundance, like a thick fringe upon the outer edge of the plants, a characteristic retained in cultivation and well shown in the accompanying wood-cut.

Florence H. Woolward del et lith. 1896.

MASDEVALLIA NYCTERINA *Rchb. f.*

Goater, Imp.

MASDEVALLIA NYCTERINA Rchb. f.

Masdevallia nycterina Rchb. f. Gard. Chron. 1873, p. 1238 ; 1874, pt. I., p. 639, fig. 134 ; pt. II., p. 715 ; 1875, pt. I., pp. 40 and 106 ; 1881, pt. II., pp. 336 and 337, fig. 64 ; Illustr. Hort. 1873, p. 25, t. 117-118 *(as M. Chimæra)* ; Floral Mag. 1875, t. 150 ; De Puydt, Les Orch. (1880), p. 285, pl. XXIII. *(as M. Chimæra)* ; Veitch Manual Orch. pt. V. (1889), p. 55.

Leaf 6 or 7 inches long, oblong-lanceolate, carinate at the back, margins waved, apex acutely tridenticulate, narrowing below in a slender grooved petiole, sheathed at the base, bright green.

Peduncle 3 or 4 inches long, terete, slender, lateral or descending from the base of the petiole, jointed, with a sheathing bract at each joint, dull reddish-green ; flowering bract nearly ½ inch long, apiculate, sheathing below, pale green, with one or two buds within at the base.

Ovary about ¼ inch long, with six crenate wings, crimson and green.

Sepals : dorsal sepal united to the lateral sepals for nearly ¼ inch, free portion triangular-ovate for 1¼ inch ; lateral sepals cohering for about ⅝ inch, triangular ovate, rounded beneath ; all pale yellow, covered with crimson spots and short stiff hairs, the inner half of the lateral sepals nearly white, all with numerous nerves, the principal nerves carinate upon the outer surface, tapering into slender terete crimson tails about 2 inches long.

Petals about ¼ inch long, oblong below, margins angled, apex bi-lobed, the outer lobe large and rounded, with numerous small papillæ in the centre, pale yellow spotted with rust-red.

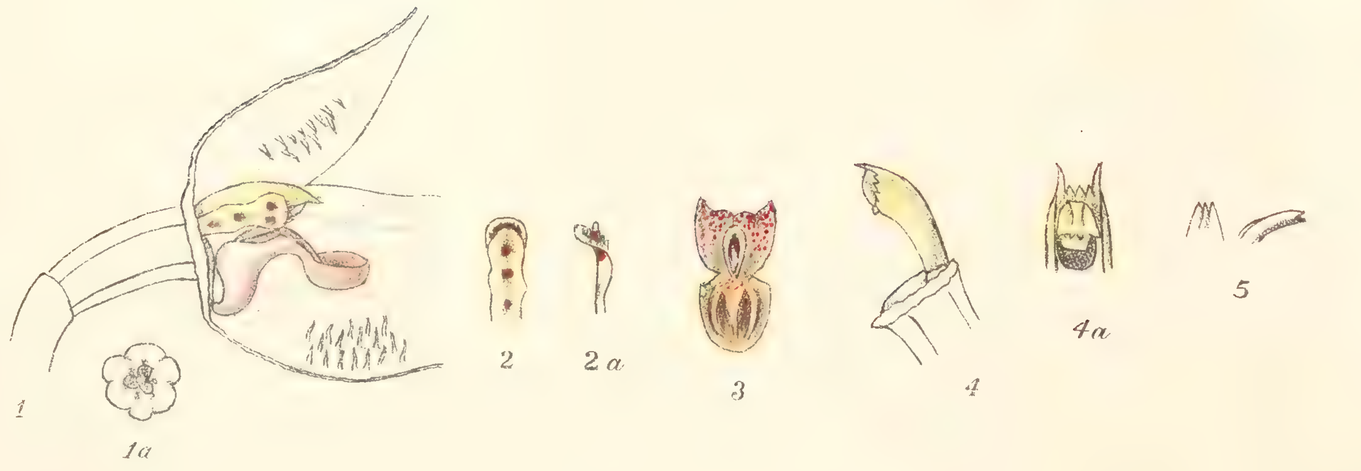
Lip scarcely ½ inch long, fleshy and deeply grooved at the base, and united to the foot of the column by a very flexible hinge, anterior portion shell-like, spreading, margins converging, pure white tinged with pale yellow, with numerous radiating keels within.

Column shorter than the petals, narrowly winged, apex denticulate, pale yellow tinged with red.

MASDEVALLIA NYCTERINA was discovered in 1872, by Gustav Wallis, near Frontino, in the Western Cordillera of Antioquia, at an elevation of 5-6,000 feet. This region is also the habitat of *M. Chimæra*, *M. Carderi*, and *M. bella*, as well as of many other species of *Masdevallia*. *M. nycterina* is closely allied to *M. bella*, which it especially resembles in the rayed, shell-like lip, but it was at first mistaken for *M. Chimæra* by Mons. Linden, who named and distributed Wallis's specimens as that species. The coloured Plates published as *M. nycterina* more nearly resemble *M. Vespertilio*, showing in each case the unrayed lip peculiar to that plant.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, petal, side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged.*



Florence H. Woolward del et lith. 1896

Goater, Imp.

MASDEVALLIA PUSILLA *Rolfe.*

MASDEVALLIA PUSILLA Rolfe.

MASDEVALLIA PUSILLA, Rolfe in Kew Bulletin, 1893, p. 335.

Leaf nearly 4 inches long, linear-lanceolate, recurved, carinate at the back, apex acutely tridenticulate, narrowing below into a grooved petiole, sheathed at the base, bright green.

Peduncle about 2½ inches long, terete, slender, descending or lateral from the base of the petiole, jointed, with a small closely sheathing bract at each joint, dull reddish-green; flowering bract ¼ inch long, apiculate, sheathing below, membranous, pale green.

Ovary scarcely ¼ inch long, with six rounded angles, dull crimson.

Sepals: dorsal sepal united to the lateral sepals for $\frac{3}{16}$ inch, forming a narrow cup, free portions ovate-triangular for about ¼ inch, 5-nerved, the central nerve carinate; lateral sepals cohering for nearly ½ inch, rounded below, oblong-ovate; all the sepals dull yellowish-white spotted with crimson, especially upon the nerves, covered on the inner surface with minute elongated papillæ, and terminating in slender terete yellow tails, about ½ inch long.

Petals very minute, oblong, with small angles upon the margins, apex bi-lobed and rounded, with minute papillæ between the lobes, pale yellow spotted with rust-red.

Lip about twice as long as the petals, basal portion large and fleshy, united to the foot of the column by a flexible hinge, deeply hollowed in the centre, the anterior portion shell-like, with three central keels, very minute, pale yellow, with pink spots.

Column a little longer than the petals, apex denticulate, with two points much prolonged, pale yellow.

THE habitat of *Masdevallia pusilla* is unknown, and the only information to be obtained about it is, that it first flowered in the collection of the Royal Botanic Gardens at Dublin, in 1891, and was sent by Mr. F. W. Moore to Kew, where it was named and described by Mr. R. A. Rolfe. It is chiefly interesting as the smallest known species of the *Saccolabiatæ*, the tiny lip, petals, and other organs, showing in miniature all the curious structural peculiarites of its larger allies.

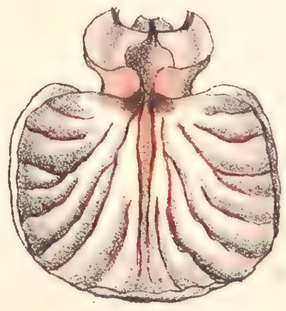
Explanation of Plate, drawn from a plant in the Royal Botanic Gardens, Glasnevin, Dublin:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—2a, petal, side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

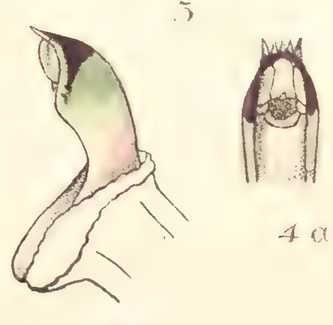
6

1 1a

2 2a



3



4 4a

5

Florence H Woolward del et lith 1894

Goater, imp.

MASDEVALLIA RADIOSA *Rchb. f.*

MASDEVALLIA RADIOSA Rchb. f.

MASDEVALLIA RADIOSA Rchb. f. Gard. Chron. 1877, pt. I., p. 684 ; 1881, pt. II., p. 336 ; Veitch Manual Orch. pt. V. (1889), p. 59.

Leaf 5 or 6 inches long and about $\frac{3}{4}$ inch broad, oblong-lanceolate, margins waved, apex acutely tridenticulate, narrowing below into a slender petiole, sheathed at the base, bright green.

Peduncle about 4 inches long, terete, lateral or descending from the base of the petiole, with numerous sheathing bracts, dull purplish-green, 2 or 3-flowered, the flowers expanding in succession ; flowering bract $\frac{1}{2}$ inch long, ovate-oblong, apiculate, sheathing below, dull green.

Ovary $\frac{1}{4}$ inch long, with six rounded angles, pale green.

Sepals all cohering for about $\frac{1}{2}$ inch, forming a wide shallow cup, gibbous below, free portions broadly oval, concave, with numerous nerves, the central nerves carinate at the back, inner surface ochre-yellow, dotted and streaked with dark purple and covered with small purple papillæ, outer surface smooth, tawny or apricot yellow, all terminating in slender tapering dark purple tails two inches long.

Petals about $\frac{3}{16}$ inch long, oblong, angled at the margin, apex cleft into two wings, with numerous dark purple papillæ within the cleft, ochre-yellow, with one or two dark purple spots.

Lip grooved and fleshy at the base and united to the foot of the column by a flexible hinge, dilated into a broad shell-like lobe, white tinged with pale pink, with numerous radiating keels within the shell.

Column short and stout, very narrowly winged, pale pink below, green or pale yellow above, with a broad band of purple, apex denticulate.

THE only known habitat of *M. radiosa* is near Frontino, in Antioquia, where it was discovered by Gustav Wallis in 1873, at an elevation of 8,000 feet. Living plants were sent by him to Messrs. Veitch, in whose collection Professor Reichenbach first saw the flowers in 1876.

A small and less attractive variety, apparently commoner in cultivation, is represented at Fig. 6 of the accompanying Plate. *M. radiosa* is closely allied to *M. bella*, *M. Chestertonii* and *M. nycterina*, which it resembles in the wide and shell-like, rather than saccate, lip.

Consul Lehmann adds the following information :

M. radiosa is one of the rarest species known to me. In fact, I have only found it in one locality, viz., in the neighbourhood of Frontino, in Antioquia. It grows on trees, always on the trunks, not far from the ground, in very damp dense woods, at an elevation of 1,600 to 2,100 mètres (5,200 to 6,835 feet). The annual mean temperature of this region ranges from 16° to 18°.5 Centigrade (about 60° to 70° Fahrenheit), and there is a heavy and constant rainfall throughout almost the whole year. Only in February, March, and August there is a short interval of finer weather, but even during these months there are but few days entirely without rain. In a wild state *M. radiosa* flowers in October and November.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, petal, side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged ;* 5, apex and section of leaf ;—6, flower of small variety ; *natural size.*

1a

2 2a

3 3a 4 4a

Florence H Woolward del et lith 1894

Goater, imp.

MASDEVALLIA TRINEMA *Rchb. f.*

MASDEVALLIA TRINEMA Rchb. f.

Masdevallia trinema Rchb. f. Flora (Singer) 1886, p. 558.

M. Lowii, Rolfe in Gard. Chron. 1890, pt. I., p. 416 ; pt. II., p. 269, fig. 44.

Leaf 6 or 7 inches long, oblong-lanceolate, carinate, acutely tridenticulate, margins waved, narrowing below in a slender petiole, sheathed at the base, bluish-green.

Peduncle 5 or 6 inches long, terete, slender, lateral or descending from the base of the petiole (rarely erect), 2 or 3-flowered, the flowers expanding in succession, with numerous sheathing bracts, pale green ; flowering bracts about $\frac{1}{2}$ inch long, oblong-ovate, apiculate, sheathing below, pale green.

Ovary $\frac{1}{4}$ inch long, with six rounded angles, purplish-green.

Sepals cohering for scarcely $\frac{3}{8}$ inch, elongated triangular, with numerous nerves, cream-white tinged with yellow, and covered with mauve-purple spots and minute papillæ, each sepal tapering into a slender flattened tail about $1\frac{1}{2}$ inch long, cream-white.

Petals about $\frac{1}{4}$ inch long, oblong, the apex cleft into two lobes, with numerous minute dark purple papillæ between the lobes, pale yellow, with a central streak and blotch of dark purple.

Lip longer than the petals, grooved at the base and united to the foot of the column by a flexible hinge, fleshy, with prominent central keels and minute radiating lateral ones, flattened, scarcely hollow, mauve-purple, with darker rays and a few spots.

Column a little longer than the petals, terete, narrowly winged, apex denticulate, pale yellow.

IT is on the authority of Consul Lehmann—who has had the advantage of examining Professor Reichenbach's dried specimens—that I identify *M. trinema* Rchb. f. with *M. Lowii* of Rolfe. The name of the original discoverer of this species is unknown, and no indication of its habitat, beyond the words "*Nov. Gran.*," is given in Reichenbach's description, written in 1886.

The plant is still very rare, the three or four specimens in cultivation having all been divided from one small piece imported from Cauca among a number of Orchids, by Messrs. Hugh Low & Co., in 1889. Mr. Sidney Courtauld was the purchaser of the new plant, and it first flowered in his collection in 1890. In a wild state the slender flower-stalks are sometimes upright, but more usually they are lateral, or descending in graceful curves through the moss which covers the roots of the plant.

Consul Lehmann has found this species in the following locality :

Masdevallia trinema occupies a very small range of the western mountains in the north of the Cauca and of Western Antioquia, in Columbia. I first found it in 1883 on the Cordillera de Belalcazar, between the towns of Cartago and Supia in the Cauca, and afterwards at Frontino and El Yarumal in the west and north-west of Antioquia. It grows on trees in thick damp woods at an elevation of 1,500 to 1,900 mètres (4,875 to 6,175 feet). It is rare in all these localities, and as a rule, it selects only those trees which border the banks of mountain streams and rivulets. At Frontino it always grows mixed with plants of *M. Peristeria*, *M. nidifica*, and *M. Carderi*. The climate of its habitat is similar to that in which *M. Chimæra* thrives, the temperature being about 1° Centigrade higher.

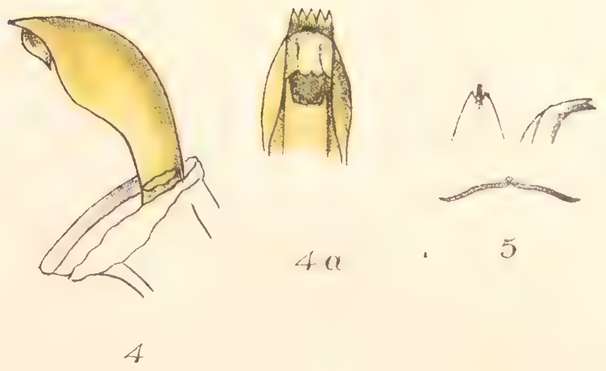
There is a marked variation in the colour of the flowers. At Frontino and El Yarumal the sepals are dull yellowish-white, densely cross-blotched with an opaque brown. In the plants found on the mountains of Belalcazar the flowers are larger, and the sepals are creamy-white, marked with lilac-brown to only two-thirds of their length, the points remaining pure white.

Masdevallia Lowii Rolfe is identical with *M. trinema* Rchb. f.

Explanation of Plate :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, petal, side ;—3, lip ;—3a, side of lip ;—4, column ;—4a, apex of column ; *all enlarged.*

(N.B.—The larger leaves in this Plate are drawn from Consul Lehmann's dried specimens, no cultivated plant having as yet attained to such dimensions.)



Florence H Woolward del et lith 1894.

Goater, imp.

MASDEVALLIA TROGLODYTES *Morr.*

MASDEVALLIA TROGLODYTES Morr.

MASDEVALLIA TROGLODYTES Morr. Belg. Hort. XXVII. (1877), p. 97, t. V., Rchb. f. Gard. Chron. 1877, pt. II., p. 300 ; 1881, pt. II., p. 409 ; 1883, pt. I., p. 278 ; Veitch Manual Orch. pt. V. (1889), p. 67.

Leaf 7 or 8 inches long, linear-lanceolate, carinate, margins waved, apex tridenticulate, narrowing below into a slender petiole, sheathed at the base, bright green. (In wild plants the leaves are 10 inches or a foot long.)

Peduncle about 3 inches long, terete, slender, lateral or descending from the base of the petiole, with numerous bracts, dull purple ; flowering bract $\frac{3}{8}$ inch long, ovate, apiculate, sheathing below, pale green tinged with purple.

Ovary $\frac{3}{16}$ inch long, with six rounded angles, dull purple.

Sepals cohering for about $\frac{1}{4}$ inch, forming a wide campanulate tube, free portions roundly triangular, with numerous nerves, the central ones carinate on the outer surface, reddish-brown within, covered with minute papillæ, with a white space and a few crimson spots in the centre beneath the lip, outer surface dull white tinged with green, nerved with dark red, all the sepals terminating in slender tails 1 or $1\frac{1}{4}$ inch long, dark red.

Petals $\frac{1}{8}$ inch long, linear at the base, margins slightly angled, cleft at the apex into two lobes, between which is a mass of minute blackish-purple papillæ, dull yellow, with a blackish-purple triangular spot.

Lip longer than the petals, grooved and fleshy at the base, and united to the foot of the column by a flexible hinge, anterior portion shallow, shell-like, with one fleshy central keel and a lateral bi-lobed keel on each side, pale pink.

Column shorter than the lip, stout, narrowly winged, apex denticulate, yellow.

THE habitat of *Masdevallia Troglodytes* is El Roblarcito, near Sonson, in Antioquia, where Consul Lehmann has found it at an elevation of 2,400 mètres (7,800 feet), flowering in December. In a wild state it is not a common species, frequenting only a small area, and growing sparingly in thick woods, close to the ground upon the trunks of trees.

The first cultivated plants were sent to Belgium by M. Lalinde, a resident at Medellin, Antioquia, and these flowered in 1876 in the collection of Mons. Oscar-Lamarche, at Liège. It is now to be seen in every collection of Masdevallias, flourishing in large masses of slender leaves, and producing its dull red-brown flowers in great profusion.

The name *Troglodytes*, or "cave-dweller," chosen for it by Mons. Edouard Morren, is as fanciful as any name given by Professor Reichenbach to other species of the "*Chimæra* section."

In general characteristics *M. Troglodytes* is closely allied to *M. Houtteana*, and may perhaps ultimately be included among the varieties of that species. The chief differences are in the colouring and in the rays within the lip, but the latter feature does not appear to be uniform in either plant.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, petal, side ;—3, lip ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size*.

Florence H. Woolward del et lith. 1895.

Goater Imp.

MASDEVALLIA VESPERTILIO *Rchb. f.*

MASDEVALLIA VESPERTILIO Rchb. f.

MASDEVALLIA VESPERTILIO Rchb. f. Bot. Zeit. 1873, p. 390; Gard. Chron. 1877, pt. I., p. 272; 1880, pt. I., p. 712; 1881, pt. II., p. 409; Veitch Manual Orch. pt. V. (1889), p. 71.

Leaf 6 or 7 inches long, oblong-lanceolate, carinate at the back, apex acutely tridenticulate, narrowing below into a grooved petiole, sheathed at the base, bright green.

Peduncle about 4 inches long, terete, slender, attenuate below, lateral or descending from the base of the petiole, jointed, with a closely sheathing bract at each joint, bearing two or three flowers in succession, dull purplish-green; flowering bract $\frac{3}{8}$ inch long, ovate, apiculate, sheathing below, with one or two buds within, bright green.

Ovary $\frac{1}{4}$ inch long, with six crenate wings, green and crimson.

Sepals: dorsal sepal united to the lateral sepals for about $\frac{1}{4}$ inch, forming an open cup, free portion triangular-ovate for nearly $\frac{3}{4}$ inch; lateral sepals cohering for nearly 1 inch, very broad, triangular-ovate, rounded below; all the sepals pale sulphur-yellow spotted with crimson, the inner surface covered with elongated papillæ, with numerous nerves, the principal ones prominent on the outer surface, terminating in slender terete tails about $1\frac{1}{4}$ inch long, yellow, with minute crimson spots.

Petals scarcely $\frac{1}{4}$ inch long, oblong, apex bilobed, with a mass of minute reddish papillæ between the lobes, pale yellow spotted with red-brown.

Lip about $\frac{1}{2}$ inch long, fleshy and deeply grooved at the base and united to the foot of the column by a very flexible hinge, anterior portion shell-like, the margins converging inwards, the inner surface quite smooth, without rays, pure white.

Column a little longer than the petals, narrowly winged, apex acutely denticulate, pale yellow, banded with red.

MANY dried specimens of *Masdevallia vespertilio* were sent to Professor Reichenbach by the collectors Roezl, Wallis, Chesterton and Patin, from the Valley of the Cauca, in Colombia, but until 1877 no living plants had been imported. The first to flower were in the collection of Sir Trevor Lawrence.

The general characteristics of the flower are constant and distinct, and the structure of the lip alone would suffice to identify the species. This organ is remarkable for the entire absence of keels or rays, a peculiarity which will be easily seen by comparing the accompanying Plate with those preceding it in the same section.

Consul Lehmann sends the following information:

Masdevallia vespertilio has almost as wide a geographical distribution as the allied species, *M. Chimæra*, and is found upon the upper slopes of the valleys between the Central and Western Cordilleras of Colombia, and also on the western declivities of the Western Cordillera at both its northern and southern extremities. It grows in dense masses upon trees in thick woods, at an elevation of 1,200 to 1,700 mètres (3,900 to 5,525 feet), and the temperature ranges between 19° and 21·5° Centigrade (about 66° to 70° Fahrenheit). The climate is uniformly damp and the atmosphere is nearly always saturated with moisture.

As a species *M. vespertilio* is most distinct and shows very little variation, the size and number of flowers upon a plant being perhaps the only perceptible difference. Throughout its entire range, from the north of Antioquia to the southern boundary of the Department of Cauca, the bright yellow of the flowers, with their rich crimson spots, is exactly similar, and several flowers are produced in succession upon the same stem. The largest-flowered plants are found at Frontino, its northern limit, and also on the highlands of Los Anayes, and on the eastern slopes of the Cerro Munchique, near Popayán. On the Cordillera of Belalcazar, a lateral range of Mountains branching off from the Cerro de Caramanta in the Western Cordillera, and running first eastwards and then southwards, and ending a little below Cartago, in Cauca, *M. vespertilio* grows in great abundance. The flowers in this region are small, but very numerous and finely coloured, as are also those found at its southern limit, near Pususquer and San Pablo, on the road from Tuquerres to Barbacoas. From this locality I introduced a large number of plants in 1880, and they still form the main stock of this species in Europe.

Explanation of Plate:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—2a, petal, side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf;—6, seed-capsule from a wild plant; *natural size*.

SECTION XII.

SALTATRICES Rchb.

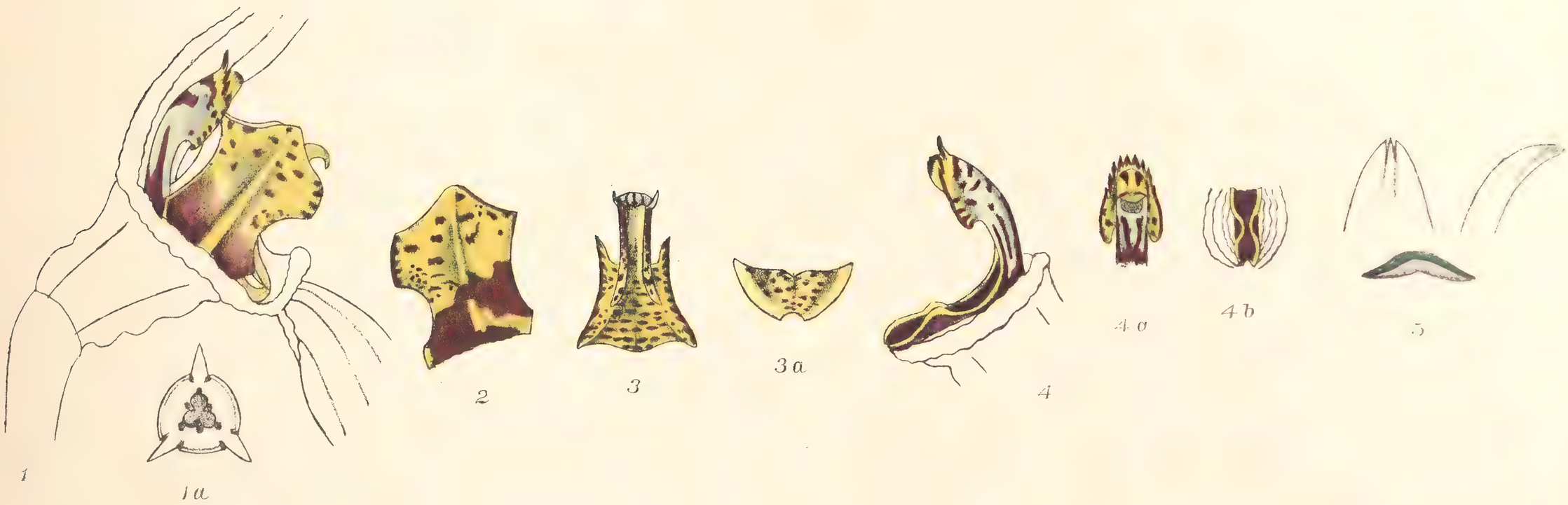
THESE small plants are unlike most species of *Masdevallia*, and will perhaps ultimately be excluded from the Genus. For the present, however, in the uncertainty arising from the scanty number of species known, I can only follow Reichenbach's classification.

2 species figured :

Masdevallia O'Brieniana Rolfe.
simula Rchb. f.

Not in cultivation :

M. Molossus Rchb. f. Linnæa XLI. (1877), p. 10.
M. Saltatrix Rchb. f. Linnæa XLI. (1877), p. 10.



Florence H. Woolward del et lith 1894.

MASDEVALLIA O'BRIENIANA *Rolfe.*

Gouldprinters

MASDEVALLIA O'BRIENIANA Rolfe.

MASDEVALLIA O'BRIENIANA Rolfe. Gard. Chron. 1890, pt. II., p. 524.

Leaf about 2 inches long and $\frac{1}{4}$ inch broad, linear-lanceolate, very thick and stiff, apex acutely tridenticulate, dark green, often tinged with purple, narrowing below in a slender grooved petiole sheathed at the base.

Peduncle about $\frac{1}{2}$ inch long, terete, slender, ascending from within a sheath at the base of the petiole, with two or three flowers expanding in succession, pale green; flowering bract $\frac{1}{4}$ inch long, membranous, apiculate, dull brown.

Ovary $\frac{1}{8}$ inch long, triangular, with three rounded lobes and three crenate wings, bright green.

Sepals: dorsal sepal united to the lateral sepals at the base only, about $\frac{3}{8}$ inch long, oblong-ovate, 3-nerved, dull yellowish, semi-transparent, with transverse crimson bars and spots, terminatiug in a slender pointed tail $\frac{1}{4}$ inch long, orange-yellow, with minute crimson spots; lateral sepals cohering for about $\frac{1}{8}$ inch, forming a shallow cup with a keel-like excrescence round the front, free portion $\frac{1}{4}$ inch long, ovate, 3-nerved, terminating in slender flattened tails $\frac{1}{4}$ inch long, yellow, with minute crimson spots; the central nerves of all the sepals are carinate at the back.

Petals $\frac{1}{8}$ inch long and nearly as broad, angled on one side, lobed on the other, apex rounded, bright yellow, blotched and spotted with crimson.

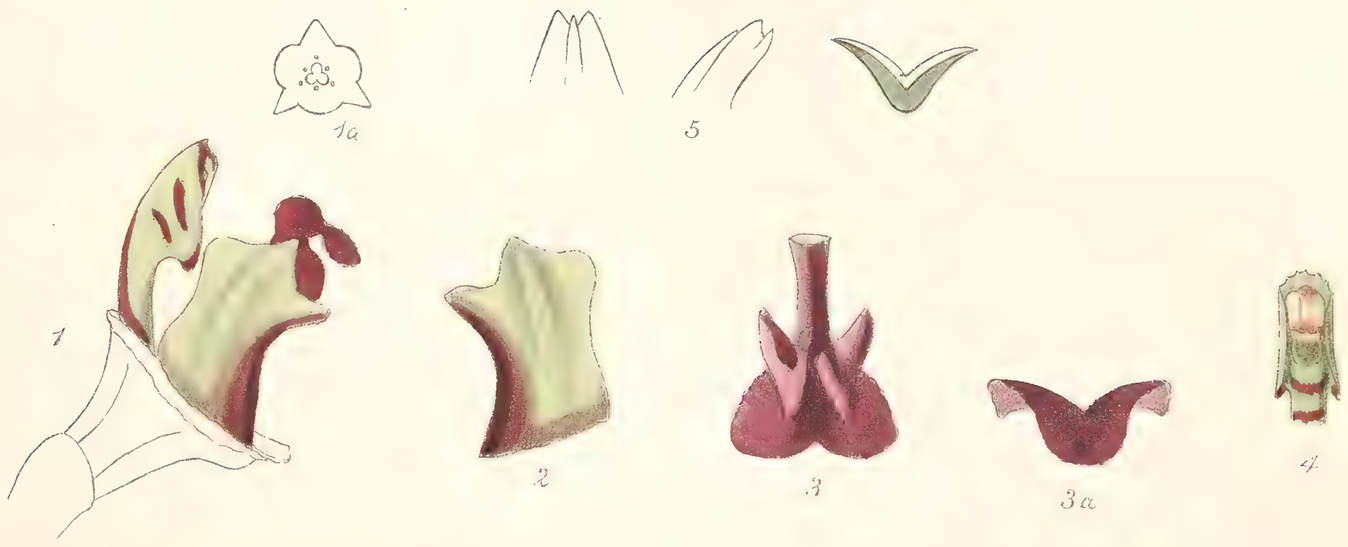
Lip rather longer than the petals, linear at the base and united to the foot of the column by a flexible hinge, anterior portion very broad, with two horn-like projections and two prominent angular lobes, apex reflexed, bright yellow, with numerous crimson spots.

Column a little longer than the petals, broadly winged, apex recurved, denticulate, greenish-yellow spotted with crimson, the foot rich crimson, with two curved longitudinal bright yellow keels.

THIS species was named and described by Mr. Rolfe in 1890, from plants which flowered in the collection of Mr. R. J. Measures. It is closely allied to *M. simula* Rchb. f., and I am unable to obtain any information whatever as to its habitat.

Explanation of Plate:

Fig. 1, petals, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, apex of lip;—4, column;—4a, apex of column;—4b, part of foot of column;—5, apex and section of leaf; *all enlarged.*



Florence H.Woolward. del.et lith.1889.

MASDEVALLIA SIMULA Rchb. f.

Hanhart imp.

MASDEVALLIA SIMULA Rchb. f.

Masdevallia simula Rchb. f. Gard. Chron. 1875, pt. I., p. 8 ; 1881, pt. II., p. 409.

Leaf 1 to 2½ inches long, and ⅛ inch broad, linear, fleshy, curved, tridenticulate, dull green tinged with purple and covered with minute excrescences, narrowing below into a slender petiole, dark green, sheathed at the base.

Peduncle about ¾ inch long, terete, 2 or 3-flowered, each flower fading before the expansion of the next, ascending from near the base of the petiole, with minute apiculate bracts.

Ovary $\frac{1}{16}$ inch long, triangular, with six grooves.

Sepals : dorsal sepal united to the lateral sepals very little beyond the base, about ¼ inch long, strongly keeled without, 3-nerved, cucullate, ovate-lanceolate, terminating in a blunt point, semi-transparent, greenish, barred with small transverse crimson spots ; lateral sepals cohering for nearly ⅛ inch, gibbous below, with a dark crimson excrescence within beneath the lip, 3-nerved, ovate-lanceolate, terminating in narrow points, yellowish green, with small transverse crimson spots.

Petals scarcely ⅛ inch long, and about half as broad, triangular at the apex, strongly angled on the anterior margin, green and crimson.

Lip rather more than ⅛ inch long, linear at the base, then with two prominent angular lobes, anterior portion cordate, with two horn-like projections, margin minutely crenate, apex much reflexed, dark crimson-purple.

Column ⅛ inch long, with triangular wings, apex minutely denticulate, green edged and spotted with crimson.

MASDEVALLIA SIMULA was discovered in 1874, by Chesterton, while collecting in Colombia for Messrs. Veitch. Its small size and the inconspicuous colour of its flowers, growing half hidden in moss at the base of the leaves, make it of little interest except to botanists, but the curious and unusual structure of the petals and lip will be found to repay careful examination. In cultivation the time of flowering is from April to July, during which time several flowers appear in succession from the same stem. The exact localities in which this little plant is to be found have not hitherto been made generally known, and are given as follows by Consul Lehmann :

This peculiar and very variable species, in my opinion more a *Pleurothallis* than a *Masdevallia*, has an extensive distribution over the Andes of Colombia and Ecuador. In the north it extends as far as the northern parts of Antioquia, growing abundantly on the highlands of Santa Rosa and Carolina, at an elevation of 2,000—2,600 mètres (6,500—8,450 feet). In the south it has been met with as far as the central and eastern districts of the province of Azuay or Cuenca, at the same elevation as in Antioquia. In the vicinity of Popayán it grows abundantly at an elevation of 1,800 mètres (5,850 feet), while on the Alto del Mojanda, between Otabalo and Malchingui, it is equally common at 3,000 mètres (9,750 feet). It occurs on the western declivities of the central and Western Andes, especially on those of the Andes of Quito, and extends from 7° N. lat. to 3° S. lat. The temperature in which this plant thrives varies greatly according to the elevation of the locality, the lowest being 9° and the highest 17°·5 Centigrade (48° to 63° Fahrenheit).

There appears to be some doubt as to whether all the different varieties belong to the same species. Up to this moment I have not been able to detect any structural difference,—merely a larger or smaller development in any plant from the different localities. The form represented in the accompanying plate is a good medium development of the species, as it is found in the vicinity of Aguadas and Sonson, and other parts of Antioquia. The smallest form is met with near Popayán and on the Alto del Mojanda, near Quito, the leaves seldom exceeding 3 centimètres (about $1\frac{1}{4}$ inch) in length. The largest form, the leaves of which attain a length of 16 or 18 centimètres ($6\frac{1}{2}$ or 7 inches), grows on rocks and trees in the damp and shady woods on the western slopes of the Corazón mountains, near Quito, at an elevation of 2,000 to 2,400 mètres (6,500 to 7,800 feet).

F. C. LEHMANN.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—3a, apex of lip;—4, apex of column;—5, apex and section of leaf; *all much enlarged.*

SECTION XIII.

TRIANGULARES Rchb. f.

(ALSO CALLED CAUDATÆ.)

THIS Section includes numerous species allied to M. triangularis. Their chief characteristics are, slender growth, the delicate membranous texture of the flowers, and in most cases, the shallowness of the tube and the great length of the tails.

10 species figured :

Masdevallia Arminii Rchb. f.
caudata Lindl. (=*M. Shuttleworthii Rchb. f.*)
Estradæ Rchb. f.
floribunda Lindl. (=*M. Galeottiana Rich. et Gal., M. myriostigma Morren., et M. Lindeniana Rich. et Gal.*
hieroglyphica Rchb. f.
ionocharis Rchb. f.
triangularis Lindl.
uniflora Ruiz et Pav. (*not in cultivation.*)
Wagneriana Rchb. f.
xanthina Rchb. f.

Not in cultivation :

M. expansa Rchb. f. Otia Bot. Hamb. (1878), p. 16.
hymenantha Rchb. f. Bonplandia III. (1855), p. 225.
inæqualis Rchb. f. Gard. Chron. 1874, pt. I., p. 372.
tricolor Rchb. f. Gard. Chron. 1882, pt. II., p. 102.
uniflora, *(see Plate.)*
velutina Rchb. f. Gard. Chron. 1875, pt. II., p. 420.

Florence H. Woolward del. et lith. 1892.

M&N. Hanhart imp.

MASDEVALLIA ARMINII *Rchb. f.*

MASDEVALLIA ARMINII Rchb. f.

Masdevallia Arminii Rchb. f. Bonplandia II (1854), p. 283; III. (1855), p. 69: Walp. Ann. VI. (1861), p. 189; Belg. Hort. 1873, p. 354; Orchidophile (Godefroy) vol. I. (1881-3), p. 368; Gard. Chron. 1881, pt. II., p. 236; 1882, pt. II., p. 102: Veitch Manual Orch. pt. V. (1889), p. 24.

Leaf 2 or 3 inches long and about $\frac{3}{8}$ inch wide, oblong-lanceolate, apex tridenticulate, bright green, narrowing below into a slender petiole, sheathed at the base, pale green, with minute blackish spots.

Peduncle, including pedicel, about $2\frac{1}{2}$ inches long, slender, terete, attenuate towards the base, ascending from a joint at the base of the petiole, very pale green; bract about $\frac{3}{8}$ inch long, membranous, apiculate, oblong-ovate, sheathing below, with a minute rudimentary bud within at the base, dull pale green, with very minute black dots.

Ovary $\frac{1}{4}$ inch long, roundly triangular, with six grooves, whitish green, with a few very minute black dots.

Sepals: dorsal sepal united to the lateral sepals for about $\frac{1}{4}$ inch, forming a shallow, open tube, free portion $\frac{3}{8}$ inch long and nearly the same in width, ovate, cucullate, 3-nerved, rose-purple, terminating in a slender orange-yellow tail, about 2 inches long; lateral sepals cohering for nearly $\frac{1}{4}$ inch, free portion $\frac{1}{2}$ inch long and the same in width, triangular-ovate, 3-nerved, rose-lilac, with a small dark purple spot at the base of each, and terminating in very slender orange-yellow tails $1\frac{1}{2}$ inch long; all sepals pale and semi-transparent at the base, the inner surface covered with very minute semi-translucent asperities, and the central nerve outwardly carinate.

Petals nearly $\frac{1}{4}$ inch long, oblong, narrowing towards the apex, with a broad keel and angle on the anterior margin, very pale yellow, shining and fleshy, apex tridentate.

Lip a little shorter than the petals, oblong, fleshy at the base and along the centre, united to the curved foot of the column by a very elastic hinge, yellowish tinged with pink, semi-transparent, apex slightly recurved, covered with small dark purple spots, and having a dark purple velvety boss in the centre.

Column equalling the lip in length, slightly winged, with a triangular projection on each side near the foot, pale yellow, blackish-crimson at the apex and base, apex dentate.

MASDEVALLIA ARMINII was first described by Professor Reichenbach in 1854, from dried specimens collected by Louis Schlim in the mountains around Ocaña and Pamplona, in the Province of Santander, Colombia. No date is assigned to his discovery, but it appears to have been prior to the year 1849, when the plant was found by Hermann Wagener at La Baja, flowering in January at an elevation of 9,000 feet.

The internal structure of *M. Arminii* differs from that of other species in the remarkable projection upon each side of the base of the column, shown at fig. 4 of the accompanying Plate. In the living flower this projection is closely surrounded, or embraced, by the curved angle of the petal, and must be designed to serve some purpose, at present unknown, in the fertilisation of the flowers by insects.

I am informed by Mr. F. Sander, who first imported living plants of *M. Arminii*, that his collector found it growing smothered in mosses in the forks and branches of trees, on the western slopes of the Andes of Ecuador, the habitat of *M. rosea*.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

Florence H. Woolward del. et lith. 1892.

M&N. Hanhart imp.

MASDEVALLIA CAUDATA *Lindl.*

MASDEVALLIA CAUDATA Lindl.

Masdevallia caudata Lindl. Gen. et spec. Orch. (1833), p. 193 ; Orch. Lind. (1846), p. 5 ; Rchb. f. Bonplandia II. (1854), p. 23 ; Walp. Ann. VI. (1861), p. 189 ; Karsten Flor. Colomb. (1862-1869), vol. II., p. 103, t. CLIII. ; Morren Belg. Hort. 1873, p. 355 ; Gard. Chron. 1875, pt. I., p. 170 ; 1881, pt. II., p. 236 ; Veitch Manual Orch. pt. V. (1889), p. 28.

M. Shuttleworthii Rchb. f. Gard. Chron. 1875, pt. I.; p. 170 ; 1881, pt. II., p. 409 ; 1884, pt. I., p. 741, *in group* fig. 141 ; Bot. Mag. t. 6372 (1878) ; Gartenflora (Regel) XXVII. (1878), p. 26 ; XXXIX. (1890), p. 457, pl. 1329 ; Illustr. Hort. 1881, p. 171, t. 435 ; Orch. Album (Warn. et Will.) vol. I. (1882), t. 5 ; Reichenbachia vol. I. (1887), p. 29, pl. 13 ; Lindenia vol. IV. (1888), p. 80, pl. CLXXXII. ; Veitch Manual Orch. pt. V. (1889), p. 28.

Var. xanthocorys Rchb. f. Gard. Chron. 1882, pt. I. p. 366 ; Orchidophile (Godefroy) vol. I. (1881-3), p. 289 ; Reichenbachia vol. I. (1887), p. 29, pl. 13 ; Veitch Manual Orch. pt. V. (1889), p. 29.

Leaf 4 or 5 inches long and about 1 inch wide, oblanceolate, tridenticulate, bright green, narrowing below into a slender grooved petiole, sheathed at the base, pale green, with black spots.

Peduncle, including pedicel, about 4 inches long, with two bracts, terete, slender, ascending from the base of the petiole, pale green ; flowering bract $\frac{1}{2}$ inch long, ovate, apiculate, sheathing, with a small rudimentary bud within at the base, pale dull green.

Ovary about $\frac{3}{8}$ inch long, with three broad and three narrow rounded angles, dull white.

Sepals cohering for about $\frac{1}{2}$ inch, dorsal sepal ovate, cucullate, clear golden yellow, with numerous minute crimson spots, and five deep crimson nerves, the lateral nerves sometimes bifurcating ; lateral sepals gibbous below, ovate-triangular for nearly 1 inch, 5-nerved, rose-coloured, closely covered with small transverse crimson spots ; all the sepals terminating in slender tails 2 or 3 inches long, orange-yellow, greenish at the back.

Petals about $\frac{1}{4}$ inch long, linear-oblong, curved, anterior margin bicarinate, terminating in a curved auricle, apex tridentate, white.

Lip $\frac{1}{4}$ inch long, oblong-pandurate, with two obscure longitudinal keels, base fleshy, grooved, with two rounded lobes beneath, whitish, with numerous rose-coloured spots, apex much reflexed, rose-pink, with darker spots.

Column a little longer than the petals, broadly winged, white, with deep crimson apex, sometimes wholly crimson, wings edged and spotted with crimson, apex dentate.

DISCOVERED by Mons. Justin Goudot, a French botanist employed by the Government of Colombia to found various scientific establishments at Bogotá. His explorations, between the years 1823 and 1842, extended from Venezuela to Bogotá, among the Cordilleras in all directions, and across the fertile valleys of the Magdalena and the Cauca. Specimens of *M. caudata* collected by him near San Fortunato, were named and described in 1833 by Dr. Lindley, who also, in 1846, described specimens found by Linden, growing upon trees on Mount Quindiu, at the height of 10,000 feet, between Los Volcancitos and Paramillo. The first drawing of this species is an excellent

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Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, underside of lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size ;*—6, *var. xanthocorys* Rchb. f., *natural size.*

one by Dr. H. Karsten, of Berlin, drawn, he informs me, in its native habitat—the mountains of Bogotá—from freshly gathered flowers, and published in his splendid work "Flora Colombiæ" (1862-9), vol. II., plate CLIII. This specimen is exactly identical with the plant now generally known as *Masdevallia Shuttleworthii*, a name conferred upon it in 1875 by Professor Reichenbach, who was perhaps—judging from a description of *M. caudata* published by him in Bonplandia II. (1854), p. 33—under the impression that the two were distinct species. He here describes the colour of the sepals as green and that of the tails violet, stating the habitat to be Caracas, a locality in which the true *M. caudata* is hardly likely to occur. Some years later, however, he appears to have decided that *M. caudata* Lindl. was identical with his *M. Shuttleworthii*, and, apparently reluctant to abandon the latter name, he called the plant in 1889 *M. caudata Shuttleworthii*.

Wild plants frequently attain a greater size than those flowering in cultivation, specimens larger than that here represented having been found by Consul Lehmann on the Savana de Bogotá, where the plant forms large thick tufts upon the trees of the western slopes.

A variation occurs in individual plants in the number of the crimson stripes of the dorsal sepal, some flowers having five, some seven, and some nine stripes. This difference is not due to any variation in the number of the nerves, but to the bifurcation or non-bifurcation, generally near the base, of one or both of the two lateral nerves.

Fig. 6 of the accompanying Plate represents the variety named by Reichenbach *xanthocorys*—yellow-helmet—which appeared in 1882 in the collection of Sir Trevor Lawrence.

Several hybrids have been raised between *M. caudata* and other species, of which one of the prettiest is *M. Geleniana* Rchb. f. (Gard. Chron. 1887, pt. II., p. 586), raised by Messrs. Sander, of St. Albans, between *M. caudata* and *M. xanthina*. The dorsal sepal is orange-yellow, with numerous small crimson spots, and the lateral sepals pale pink tinged with yellow, and having some of the small transverse spots so remarkable in *M. caudata*. The tails are slender, about 3 inches long, and bright orange-yellow.

M. caudata-Estradæ Rolfe (Gard. Chron. 1889, pt. I., p. 714) is a hybrid raised by Mr. Seden for Mr. Veitch from *M. caudata* and *M. Estradæ*. The dorsal sepal is rose-purple, yellowish at the base, the lateral sepals soft violet-purple, paler at the apex. The tails are about 2 inches long, orange-yellow.

M. Courtauldiana Rchb. f. (Gard. Chron. 1889, pt. I., p. 200) was raised by Mr. Norman Cookson, of Oakwood, Wylam-on-Tyne, from *M. rosea* and *M. caudata*. The dorsal sepal and tail are light brownish, and the lateral sepals light rose-colour.

Consul Lehmann contributes the following information :

M. caudata grows upon oaks and other trees and shrubs, always near the ground, in dense and very damp woods or forests on the northern, western, and southern slopes of the Savana de Bogotá ; and also on the western declivities of the Paramo de Santa Rosa and Sumapaz, in the Province of Cundinamarca, at an elevation of 2,000 to 2,500 mètres (6,500—8,125 feet). Plants with the largest and most finely coloured flowers are found chiefly on the descent from the Montaña de Subaté to Fusagasugá, and along the Salto de Tequendama, the same locality visited by Goudot, and where he probably found his specimens.

The annual mean temperature of the habitat of *M. caudata* is between 14° and 16° Centigrade (about 57° to 61° Fahrenheit), and it flowers from February to May. Shade and constant moisture are essential to the development of this species.

The variety *xanthocorys* is most abundant in the woods of Supatá, Pacho and Veragua Grande, on the western declivities of the western mountains of Zipaquirá, about ninety miles north of Bogotá.

Florence H. Woolward del. et lith. 1892.

MASDEVALLIA ESTRADÆ *Rchb. f.*

M&N. Hanhart imp.

MASDEVALLIA ESTRADÆ Rchb. f.

Masdevallia Estradæ Rchb. f. Gard. Chron. 1874, pt. I., p. 435; 1881, pt. II., p. 236; Bot. Mag. t. 6171 (1875); Gartenflora (Regel) 1875, p. 374; Belg. Hort. 1875, pl. XXI.; Orchidophile (Godefroy) vol. I. (1881), p. 345 with fig.; Veitch Manual Orch. pt. V. (1889), p. 42.

Var. ludibunda=Masdevallia ludibunda Rchb. f. Gard. Chron. 1882, pt. I., p. 179; Orchidophile (Godefroy) vol. I. (1881-3), p. 270; Veitch Manual Orch. pt. V. (1889), p. 50.

Leaf 2 or 3 inches long, obovate, apex tridenticulate, bright green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle, including pedicel, 3 or 4 inches long, terete, slender, with two brownish sheathing bracts, ascending from a joint near the base of the petiole, sometimes two or three from the same petiole, pale green; flowering bract nearly ½ inch long, oblong-ovate, acuminate, sheathing below, with a minute rudimentary bud within at the base, brownish-green.

Ovary about ⅜ inch long, with six rounded angles, whitish.

Sepals cohering for nearly ¼ inch, forming an open shallow tube, dorsal sepal obovate, cucullate, 5-nerved, rich magenta-crimson, with yellow at the base and margins; lateral sepals oblong for about ⅝ inch, 3-nerved, whitish, with rich magenta-crimson at the base; all terminating in slender orange-yellow tails, 1½ inch long.

Petals about ¼ inch long, linear-oblong, apiculate, with a strong keel on the anterior margin, inner surface viscid beneath the keel, which terminates in a curved auricle, whitish.

Lip nearly ¼ inch long, oblong-ovate, fleshy and grooved at the base, united to the curved foot of the column by a very flexible hinge, pale pink, with numerous small crimson spots, apex a velvety dark crimson boss.

Column about ¼ inch long, broadly winged, white, with magenta foot, apex dentate, dark crimson, wings edged and spotted with crimson.

THE first flowers of *Masdevallia Estradæ* seen in England were from plants in the possession of Mr. Williams, of Holloway, who obtained them in 1873 from Antioquia, through a Belgian collector named Patin. Dried specimens had been previously sent to Professor Reichenbach by Gustav Wallis, from the garden of Señora Estrada, a Spanish lady resident in New Granada. Wallis, however, supplied no information as to the habitat of the plant.

In 1882 a very closely allied plant was imported by Messrs. Sander, of St. Albans, and named *M. ludibunda* by Professor Reichenbach as a distinct species. Careful comparison of both plants has, however, convinced me that *M. ludibunda* can only be considered a variety of *M. Estradæ*. The flowers of the variety are rather larger and the colours paler than in those of the type, the chief differences being that the dorsal sepal of the variety is less erect and more concave, and the wings of the column straighter and narrower.

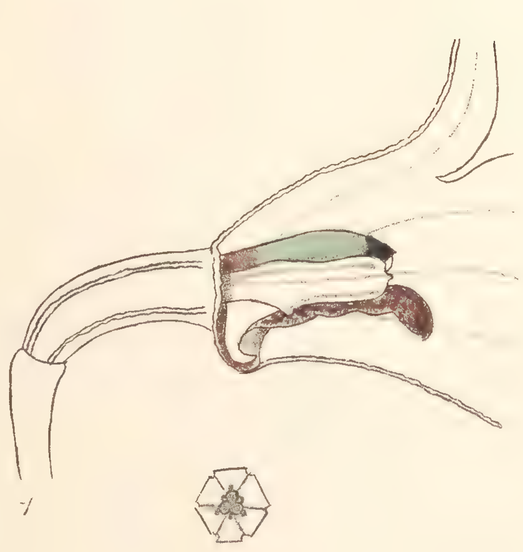
Explanation of Plate, drawn from a plant at Newbattle Abbey:

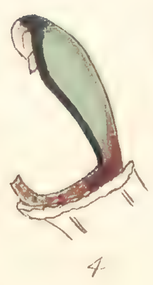
Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

Consul Lehmann agrees with me in considering *M. ludibunda* Rchb. f. to be only a variety of *M. Estradæ*, and supplies, as follows, information concerning their habitat, hitherto unknown :

Masdevallia Estradæ grows on trees in thick damp woods in Antioquia and Cundinamarca, at an elevation of 2,000 to 2,500 mètres (6,500 to 8125 feet). It is abundant on the Alto de Alegrias and Cerro Horqueta on the Western Andes of Antioquia ; about Carolina on the Highlands of Santa Rosa ; near La Palma and on the Alto de San Miguel near Medellin ; and about the Roblarcito and the Encimada near Sonson and Aguadas. In Antioquia *M. Estradæ* grows mixed with *M. xanthina*, but the two species are easily to be distinguished even when out of flower. The climate of these localities is extremely damp, few days in the year passing without rain, and the average temperature is between 14° and 18° Centigrade (about 57° to 64° Fahrenheit).

The variety *ludibunda* (*M. ludibunda* Rchb. f.) grows in a similar climate in great abundance on the western slopes of the Páramo de Guerrero, the Alto Chaquira and the Páramo de Rabon in the vicinity of Pacho, Cundinamarca, and also near Zipaquira.





Florence H.Woolward del.et lith.1892 .

M&N. Hanhart imp

MASDEVALLIA FLORIBUNDA *Lindl* .

MASDEVALLIA FLORIBUNDA Lindl.

MASDEVALLIA FLORIBUNDA Lindl. Bot. Reg. (1843), p. 72, misc. 112; Rchb. f. Linnæa XVIII. (1844), p. 400; Morren Belg. Hort. vol. XXIII. (1873), pp. 353, 356, and 361; Flore des Serres t. XIX. (1873), p. 132; Gard. Chron. 1877, pt. II., p. 616; 1879, pt. I., p. 559; 1881, pt. II., p. 305; Godm. et Salv. Biologia Centr. Amer., Bot. Hemsley, vol. III. (1882-1886), p. 207; Veitch Manual Orch. pt. V. (1889), p. 43.

M. Galeottiana Rich. et Gal. Ann. Sci. Nat. ser. 3, vol. III. (1845), p. 17 (tab. 3, fig. 1, *ined.*).

M. myriostigma (errore myriosigma) Morren, Belg. Hort. vol. XXIII. (1873), p. 361, pl. XXIII.; Flore des Serres t. XIX. (1873), p. 132; Gard. Chron. 1877, pt. II., p. 616; Orchidophile (Godefroy) vol. I. (1881-3), p. 647; 1885, p. 123.

Leaf about 3½ inches long, oblong-lanceolate, fleshy, apex tridenticulate, bright shining green, narrowing below into a fleshy grooved petiole, sheathed at the base.

Peduncle about 4 inches long, very slender, terete, wiry, with two sheathing bracts, dull green streaked with crimson, ascending from within a sheath at the base of the petiole; flowering bract ⅜ inch long, membranous, apiculate, sheathing below, brownish, with a minute rudimentary bud within at the base.

Ovary ¼ inch long, hexagonal, curved, with six deep grooves, dull green.

Sepals: dorsal sepal united to the lateral sepals for ¼ inch, forming a narrow tube, gibbous beneath, free portion triangular, 3-nerved, yellow, with numerous minute crimson spots, tapering into a fleshy tail ½ inch long, brownish-orange; lateral sepals cohering for ½ inch, ovate, 3-nerved, pale yellow, nearly white towards the anterior margin, with very numerous minute crimson spots, tapering into terete fleshy tails ⅜ inch long, brownish-orange.

Petals 3/16 inch long, linear, apiculate, with a pointed keel on the anterior margin, posterior margin thickened, white.

Lip ¼ inch long, oblong, united to the curved foot of the column by a flexible hinge, base fleshy, cordate, white, with numerous minute crimson spots, apex reflexed, dull yellow, with a brown central mark.

Column 3/16 inch long, winged, green, apex and wings blackish-purple, base crimson, foot yellow, apex entire.

THE date of the discovery of *M. floribunda* is apparently 1840, when it was found by several botanists in nearly the same locality in the Cordillera of Vera Cruz, South Mexico. Henri Galeotti, a French botanist, who explored and collected in Mexico from 1835 to 1840, found it growing on oak trees near Vera Cruz, and flowering in profusion during the greater part of the year. His plants, sent alive to Europe, were probably

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Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged;*—5, apex and section of leaf;—6, yellow variety; *natural size.*

those described as *M. floribunda* by Dr. Lindley, who received living flowers from the garden of Mr. J. Rogers, of Sevenoaks. Leibold and Harris also found the plant in 1840, near Jalapa, at an elevation of 3,000 to 4,000 feet, and from Leibold's specimens Professor Reichenbach wrote his description in "Linnæa," 1844. Specimens were described in 1845 under the name of *M. Galeottiana* by Achille Richard and Galeotti, and a drawing of the plant was made by the latter, but was, unfortunately, never published. The second synonym, *myriostigma*, was given to the plant in 1873 by Mons. Morren, editor of the Belgique Horticole, under the impression that it was specifically distinct from *M. floribunda*. The plants thus named were brought by Mons. Omer de Malzaine from Cordova, about fifty miles w.s.w. of Vera Cruz, and were cultivated in the gardens of Messrs. Jacob and Makoy, at Liège.

At the present time the name *M. myriostigma* is applied by foreign horticulturists to varieties of *M. floribunda* more or less differing from the type. The unspotted yellow variety represented at fig. 6 of the accompanying Plate was sent to me by Messrs. Seeger and Tropp, of Dulwich, who purchased it in Belgium as *M. myriostigma*. So far as I am aware, the closely spotted form most common in this country, and the pale yellow, almost spotless variety, represent the two extremes of variation, between which numerous gradations are to be met with, the internal structure and colouring being in all cases identical. Professor Reichenbach states that the little brown dots scattered over the sepals vanish as the flower fades, when it appears simply yellowish. I have never found this to be the case. In spotted flowers the spots are visible, though perhaps not quite so dark, after the flower has faded; and in freshly-gathered flowers of the yellow variety the only spots present are few in number and very minute.

Florence H. Woolward del et lith 1894.

Hanhart imp.

MASDEVALLIA HIEROGLYPHICA. *Rchb, f.*

MASDEVALLIA HIEROGLYPHICA Rchb. f.

MASDEVALLIA HIEROGLYPHICA Rchb. f. Gard. Chron. 1882, pt. II., p. 230 ; 1885, pt. II., p. 584 ; 1887, pt. II., p. 334 ; Orchidophile (Godefroy) 1881, p. 400 ; 1886, p. 2 ; Veitch Manual Orch. V. (1889), p. 45.

Leaf about 4½ inches long, oblong-oval, tridenticulate, bright green, narrowing below into a slender grooved petiole, yellowish-green, with very minute black spots, sheathed at the base.

Peduncle 3 inches long, very slender, with two sheathing bracts, pale green, ascending from within a sheath at the base of the petiole ; flowering bract ⅜ inch long, membranous, apiculate, pale green tinged with brown.

Ovary ¼ inch long, with six grooves, whitish, shining, with minute black spots.

Sepals : dorsal sepal united to the lateral sepals for ½ inch, forming a wide tube, gibbous below, free portion triangular-ovate, cucullate, 3-nerved, terminating in a very slender decurved tail about 2 inches long, beneath the base of which is a fleshy oval papillus, crimson-purple ; lateral sepals cohering for ¼ inch, triangular-ovate, the outer margin much rounded, 3-nerved, tapering into slender tails 2½ inches long ; colour, yellow at the base of the tube, then semi-transparent whitish, spotted and nerved with purple-crimson, the lateral sepals paler, tails orange-yellow shaded with crimson.

Petals $\frac{3}{16}$ inch long, ovate-oblong, with a prominent hooked keel on the anterior margin, curving forward in front of the column, pale yellow.

Lip about ¼ inch long, oblong, nearly flat, apex slightly recurved, dull purple, with numerous minute darker spots and three inconspicuous longitudinal lines.

Column ¼ inch long, with long triangular wings, widest at the base, white, the wings spotted and shaded with dark purple.

MASDEVALLIA HIEROGLYPHICA is nearly allied to *M. Arminii,* but differs remarkably in some respects from that and all other species. The wings of the column are curiously developed and prolonged on each side, especially towards the base (see figs. 4 and 4a), and still more characteristic is the dark purple excrescence under the base of the dorsal tail, shown, enlarged, at x fig. 1. No other known species has this peculiarity, and it seems inexplicable that Professor Reichenbach should have overlooked such a remarkable feature when he wrote, from fresh specimens, his minute and accurate description of the colouring of the flower in Gard. Chron. 1885, pt. II., p. 584. The use of this curious wart in the economy of the plant may possibly be to check unsuitable insects in their attempts to enter further into the flower, presenting an attraction beyond which they do not care to penetrate. This surmise is founded on the fact that in almost all the numerous specimens which I have examined, this succulent morsel has been gnawed by insects, and in some cases entirely consumed.

The first plants of this species were imported from Ocaña by Messrs. Sander in 1882, no further information as to its habitat being available.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, apex of lip ;—4, column ;—4a, apex of column ; *all enlarged* ;—5, apex and section of leaf, *natural size.*

Florence H.Woolward del. et lith. 1892.

MASDEVALLIA IONOCHARIS *Rchb. f.*

M&N. Hanhart imp.

MASDEVALLIA IONOCHARIS Rchb. f.

Masdevallia ionocharis Rchb. f. Gard. Chron. 1875, pt. II., p. 388 ; 1881, pt. II., p. 305 ; Bot. Mag. t. 6262 (1876) ; Garden 1876, pt. II., p. 503 *with fig.* ; Gartenflora (Regel) vol. XXVI. (1877), p. 87 ; vol. XXVII. (1878), p. 207, *with fig.* p. 208 ; Orchidophile (Godefroy) vol. I. (1881-3), p. 666, *with fig. as in Gartenflora ;* Veitch Manual Orch. pt. V. (1889), p. 48.

Var. approviata hort.

Leaf 4 or 5 inches long and about ½ inch wide, ovate-lanceolate, carinate, apex acutely tridenticulate, bright green, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle 3 or 4 inches long, with two sheathing bracts, terete, slender, ascending from within a sheath at the base of the petiole, pale green ; flowering bract ½ inch long, carinate, apiculate, 3-nerved, with a rudimentary bud within at the base, brownish-green.

Ovary ¼ inch long, with six grooves, pale green.

Sepals cohering for about ½ inch, forming a wide gibbous tube, greenish-white, spotted with rose-purple ; free portion triangular-ovate for about ¼ inch, 3-nerved, the nerves strongly carinate on the outer surface, white, covered on the inner surface with minute velvety hairs, and terminating in slender greenish-yellow tails ¾ inch long.

Petals about ¼ inch long, oblong, apiculate, curved, broadly keeled and angled on the anterior margin, the inner surface viscid beneath the angle of the keel, pale transparent ivory-yellow.

Lip about ⅜ inch long, fleshy and deeply grooved at the base, united to the curved foot of the column by a very flexible hinge, pandurate, white, with rose-purple spots near the base, and two longitudinal purple keels, apex much reflexed, terminating in a point, bright orange.

Column about ¼ inch long, broadly winged, whitish-green, spotted on the foot with rose-purple, apex minutely denticulate.

MASDEVALLIA IONOCHARIS was discovered in 1874 by Davis while collecting in Peru for Mr. Veitch, who states the locality to be "the Andean valley of Sandia, in the province of Caravaya," at an elevation of 9,000 to 10,000 feet.

A variety of this species exists in more than one collection under the name of *Masdevallia approviata*, the flowers of which are whiter, more slender, and less spotted ; the column also is entirely white and the lip more brightly marked with rose-purple. The leaf is darker green, and the denticulation of the apex is sharper than in the type. I can obtain no information as to the history of this variety, except that it was sold at Stevens' Rooms by Messrs. Protheroe and Morris in February 1887 under the above name, which does not appear to have ever been published or attached to any distinct species. The plant is probably merely a local variety of *M. ionocharis*.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—3a, apex of lip ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of lip. *natural size.*

78

Florence H. Woolward. del. et lith. 1891.

MASDEVALLIA TRIANGULARIS *Lindl.*

M&N. Hanhart imp.

MASDEVALLIA TRIANGULARIS Lindl.

MASDEVALLIA TRIANGULARIS Lindl. Orch. Lind. (1846) p. 5; Rchb. f. Bonplandia II. (1854), p. 23 (*nomen tantum*); Walp. Ann. VI. (1861), p. 188; Belg. Hort. 1873, p. 360; Gard. Chron. 1881, pt. II., p. 409; 1882, pt. I., p. 44; Orchidophile (Godefroy) vol. I. (1881-3), p. 193; Veitch Manual Orch. pt. V. (1889), p. 65.

Leaf 5 or 6 inches long, and about 1 inch broad, oblanceolate, carinate, sharply tridenticulate, bright green, narrowing below into a slender, grooved, blackish petiole with blackish membranous sheaths at the base.

Peduncle 4 or 5 inches long, terete, slender, ascending from a joint near the base of the petiole, bright green, with a few minute black dots and one or two blackish bracts; flowering bract $\frac{3}{8}$ inch long, oblong-ovate, carinate, apiculate, sheathing below, dull green or blackish.

Ovary $\frac{3}{8}$ inch long, slender, with six rounded angles, very pale green dotted with black.

Sepals all cohering for about $\frac{3}{8}$ inch; dorsal sepal triangular-ovate for about $\frac{5}{8}$ inch, slightly cucullate, 3-nerved, carinate at the back; lateral sepals triangular-ovate for about $\frac{3}{4}$ inch, 3-nerved; all ochre-yellow, with numerous small transverse purple spots, and terminating in slender dark purple tails, about 2 inches long.

Petals scarcely $\frac{1}{4}$ inch long, oblong, curved, tridenticulate, anterior margin strongly keeled, and terminating in a long curving angle, white.

Lip nearly $\frac{1}{4}$ inch long, oblong-pandurate or oblong-triangular, with two obscure longitudinal keels, grooved and fleshy at the base and united to the curved foot of the column by a flexible hinge, whitish, with small pink and crimson spots, apex narrow, much reflexed, crimson-purple, covered with stiff hairs.

Column $\frac{1}{4}$ inch long, white or very pale yellow, narrowly winged with crimson, apex slightly dentate.

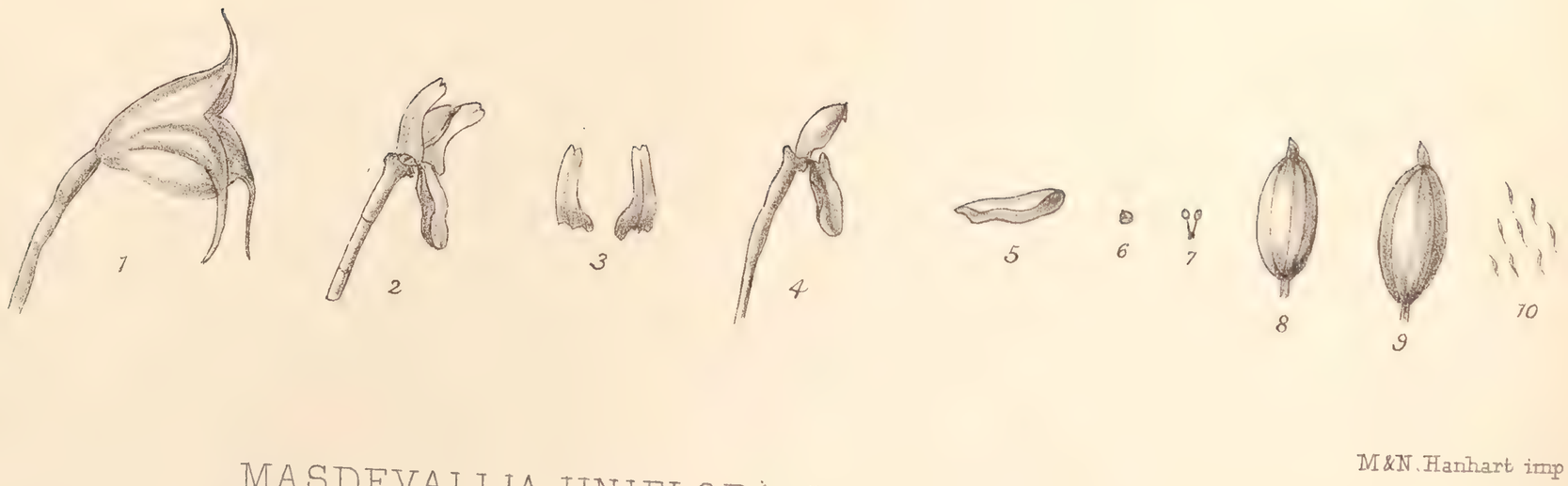
MASDEVALLIA TRIANGULARIS was discovered by Linden in June, 1842, growing upon trees on the Quebrada of Murmuquena, near Bailadores in the Province of Merida, Venezuela, at an altitude of 4,800 feet in a temperature of 68° Fahrenheit. It was also found near Caracas by Wagener and in Tovar by Moritz. The first living plants were imported in 1881 by Mr. F. Sander, of St. Albans, and the richly-coloured form represented in the accompanying Plate is probably a plant from his original importation, my first drawing of the species having been made in 1883, at Newbattle Abbey. This variety appears to be rare, for the flowers of most plants now in cultivation are more green than yellow, only slightly spotted, and with greenish-purple tails.

Consul Lehmann sends the following note:

The habitat of *M. triangularis* is in the central mountains of Venezuela, from the Department of Carabobo to Merida, at an elevation of 1,800 to 2,300 mètres (5,850 to 7,475 feet). It grows on the trunks of trees in damp shady woods, in a mean temperature of 15° to 18° Centigrade (about 59° to 65° Fahrenheit).

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—2a, petal from another specimen;—3, lip;—3a, lip from another specimen;—4, column;—4a, apex of column, *all enlarged;*—5, apex and section of leaf, *natural size.*



Florence H. Woolward lith. 1893.

MASDEVALLIA UNIFLORA *Ruiz et Pavon*.

M&N. Hanhart imp.

MASDEVALLIA UNIFLORA Ruiz et Pav.

MASDEVALLIA UNIFLORA Ruiz et Pav. Flor. Peruv. et Chil. Prodromus (1794), p. 122, t. XXVII.; Syst. Veg. Flor. Peruv. et Chil. vol. I. (1798), p. 238; Humboldt, Bonpland, et Kunth Nov. Gen. et Spec. Plant. vol. I. (1815), p. 361, t. 89 (*non Ruiz et Pav.*); Lindl. Gen. et Spec. Orch. (1833), p. 193; Rchb. f. Bonplandia IV. (1856), p. 216; Belg. Hort. 1873, p. 360.

Leaf 4 or 5 inches long and ½ inch wide, oblong-lanceolate, narrowing below into a long slender grooved petiole, sheathed at the base, apparently bright green, apex tridenticulate.

Peduncle 5 or 6 inches long, terete, slender, ascending from within a sheath at the base of the petiole, with two sheathing bracts, green; pedicel from ⅜ to ¾ inch in length; flowering bract about ½ inch long, apiculate, sheathing below.

Ovary nearly ⅜ inch long, curved, with six grooves, green or purplish.

Sepals cohering for about ½ inch, forming a rounded tube, all ovate-triangular, 3-nerved, white, yellow at the base, terminating in slender purplish tails about ½ inch long.

Petals ¼ inch long, oblong, with a curved angle on the anterior margin, apex dentate, probably white with one purple streak.

Lip ¼ inch long, oblanceolate, thickened at the base, margins very slightly waved, probably pale purple, with three central lines and purple apex.

Column not available for description.

ESPECIAL interest attaches to *Masdevallia uniflora* as the first *Masdevallia* made known to science. It was discovered by Hippolito Ruiz and José Pavon, Spanish botanists who travelled in Peru and Chili between the years 1777 and 1793, to explore for the Spanish Government the Cinchona forests of Peru. The name *Masdevallia* was originated by them in honour of their fellow-countryman Dr. Josepho Masdevall, a celebrated botanist and physician of the eighteenth century. The only locality known as the habitat of *M. uniflora* is Huassa-huassi, about twelve miles from Tarma, a small town in a valley of the Peruvian Andes, 9,738 feet above the level of the sea, and about 125 miles E.N.E. from Lima. Tarma was the head-quarters of Ruiz and Pavon during the autumn of 1779, and the result of their numerous expeditions in the neighbourhood of this town was the discovery of many new and rare plants. At the date of their visit to Huassa-huassi, it was a small village of about forty inhabitants, and is described by Ruiz in his diary as being situated in the depths of a steep narrow ravine, upon the banks of a mountain torrent of the same name, which precipitates itself rapidly from rock to rock in one continuous and beautiful cascade of snow-white foam. About five miles from the village stretched the primeval forests, up to the borders of which barbarous Indian tribes from remote regions carried on their campaigns. The mountain slopes around Huassa-huassi are very beautiful, covered with brilliant flowering plants, among which Orchids are the most abundant, their bulbs crowding the entire surface of the driest and most rocky ground, while their curious and elegant flowers fill the air with fragrance.

In the Quichua language—the language of the Incas of Peru—the name Huassa-huassi signifies "many houses," and the local name for *M. uniflora* is stated to be "Rima-rima," an appellation given in this part of Peru to many other flowers, especially Orchids.

Since its discovery, more than one hundred years ago, *M. uniflora* has never again been met with, and there is no record that its habitat has since been visited by any botanist. It has never been in cultivation, and is only known to botanists as a dried plant, of which, so far as I can ascertain, four specimens still exist, two in the Museum at Madrid, one in the Boissier Herbarium at Chambésy, and a small one consisting of a bud and two leaves (fig. 11 in the accompanying Plate), given to me by Dr. Miguel Colmeiro of Madrid. To Dr. Colmeiro I am also indebted for the graceful drawing here published—executed by his former pupil, Señor Manuel Janèr, from the best of

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Description of Plate:

Fig. 1, flower;—2, petals, lip, and column;—3, petals;—4, lip and column;—5, lip;—6, anther-case;—7, anthers;—8 and 9, seed-capsules;—10, seeds;—11, specimen sent from Madrid.

Ruiz and Pavon's specimens—as well as for an exact description of the colouring of the flowers, taken from unpublished notes by the two botanists. This valuable material has enabled us to give the first complete representation of *M. uniflora*, the only drawing made by Ruiz and Pavon being a wood-cut of a single detached flower, with botanical details, published in the Prodromus of their magnificent book upon the Flora of Peru and Chili. It was evidently their intention to prepare a more complete drawing of the plant, for, in their "Systema Vegetabilium" a seventh volume of their great work is referred to; only four volumes, however, were published. No fresh flowers of *M. uniflora* being available for dissection, it has been thought advisable to copy the botanical details from the wood-cut given by Ruiz and Pavon, as shown in the accompanying Plate at figs. 6 to 10.

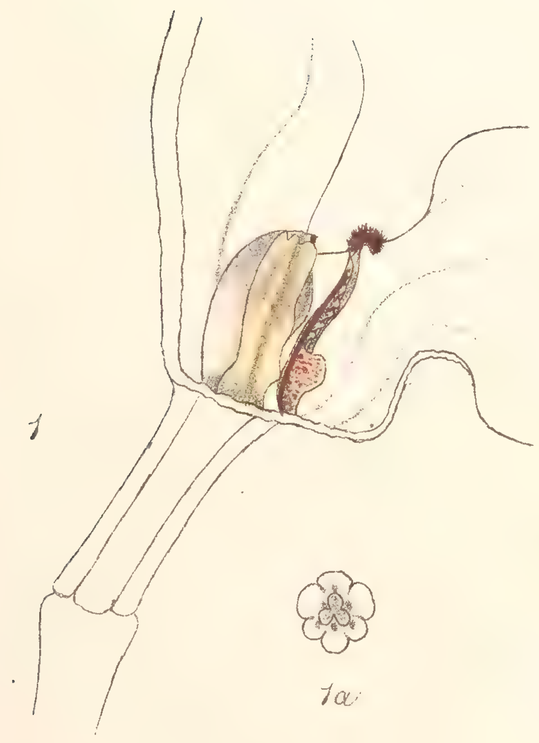
The plant represented as *M. uniflora* by Humboldt, Bonpland, and Kunth, in their "Nova Genera et Species Plantarum," is undoubtedly not the original species so named by Ruiz and Pavon, and the drawing was suspected by Dr. Lindley "to have been made up with the flowers of *M. coriacea* and the leaves of *M. lævis*." This suspicion was shared by Professor Reichenbach, who described *M. uniflora* in Bonplandia IV., 1856, from a specimen which had formed part of a very valuable collection of dried plants belonging to Pavon, and after his death discovered by Mons. Reuter hidden away in a garret in Madrid. Mons. Reuter purchased the collection for the Boissier Herbarium, of which he was then Curator, and the Orchids were submitted to Professor Reichenbach for examination and description. The present Curator of the Boissier Herbarium, Mons. Eugène Autran, has most kindly allowed me to examine this specimen, which consists of four leaves and two flowers, with one petal and lip detached, the apparent colouring of the sepals agreeing exactly with the colour-description quoted below from Ruiz's manuscript at Madrid. A drawing of this specimen, together with the small dried piece and the drawing sent to me from Madrid by Dr. Colmeiro, may be seen in the Natural History Museum at South Kensington, to which I have presented them in order to preserve a record of every known example of this interesting and mysterious plant.

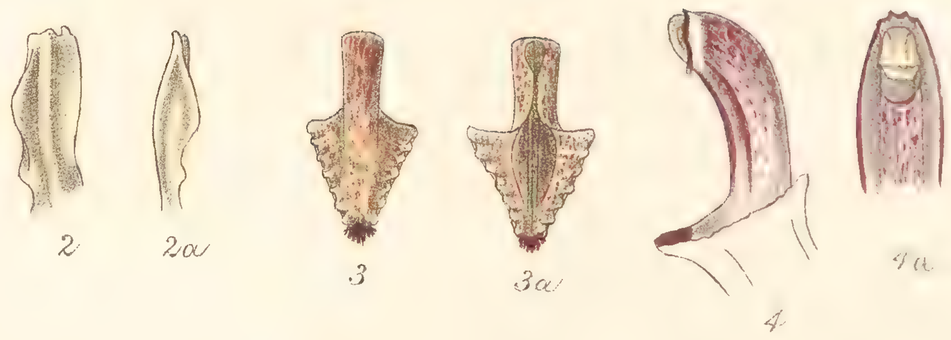
The species most nearly allied to *M. uniflora* appears to be *M. ionocharis*, which it resembles in the shape of the petals, and still more in the shape, venation, and general appearance of the sepals, as well as in the outline of the leaves, with their long slender petioles.

The following are unpublished descriptions by Ruiz and Pavon, the first, sent from Madrid by Dr. Colmeiro, giving the exact colour of the flowers; the second was copied for me by Mr. Carruthers, together with much of the above information, from a volume of manuscript notes by Ruiz in the Botanical Library of the Natural History Museum, from which also Consul Lehmann kindly translated for me Ruiz's account in Spanish of the neighbourhood of Huassa-huassi:

"*Masdevallia uniflora: foliis oblongo-spathulatis, pedunculis unifloris, longissimis. Radix fasciculata, fibrosa: fibræ ramosæ, filiformes, longissimæ in verticillos. Folia oblongo-spathulata, longe petiolata, glabra emarginata cum denticulo. Petiolus canaliculatus, triarticulatus exarticulatione petioli media ortus. Pedunculus subpedalis, erectus, teres, glaber, biarticulatus, uniflorus, vaginis totidem. Corolla basi lutea ad medium alba, apice purpurascens, tricornis; hujus color maxime variat. Nectaris labium inferius carinatum supra convexum, stagnatis fere formæ.*"

"*Calyx spathæ vagæ. Spadix simplex. Perianthium nullum. Corolla monopetala, campanulata, trifida: laciniis ovatis, corniculatis; superiore paulo-minori, basi sericea, corniculis subulatis simplicibus. Nectarium triphyllum incurvens lacinia superiore corollæ; foliolis receptaculo insertis duobus latere pistilli, maxillæformibus; alterum pistillo oppositum pedicellatum ovatum (en forma de Talma) integrum. Stamina filamento duo brevissima labio superiori nectarii insidienta. Antheræ obovatæ tectæ. Pistillum germen oblongum contortum inferum. Stylus longia carinatus. Stigma obsoletum. Pericarpium capsula oblongia unilocularis trivalvis. Semina numerosa minutissima. Receptaculum lineare adnatum singulæ valvæ pericarpi.*"





Florence H. Woolward. del. et lith. 1891.

M&N. Hanhart imp.

MASDEVALLIA WAGENERIANA *Rchb. f.*

MASDEVALLIA WAGENERIANA Lindl.

MASDEVALLIA WAGENERIANA Lindl. in Paxt. Fl. Gard. vol. III. (1852-3), p. 74, fig. 267 ; *Rev. ed.* (1884) vol. III., p. 138, fig. 250 ; Rchb. f. Bonplandia II. (1854), p. 23 ; Bot. Mag. t. 4921 (1856) ; Xen. Orch. I. (1858), p. 199 ; pl. 75, fig. II. ; Walp. Ann. VI. (1861), p. 188 , Gard. Chron. 1881, pt. I., p. 720 ; pt. II., p. 409 ; 1883, pt. I., p. 598 ; Orchidophile (Godefroy) vol. I. (1881-3), p. 52 ; Veitch Manual Orch. pt. V. (1889), p. 71.

Leaf about 2 inches long, spathulate, coriaceous, carinate, apex tridenticulate, dark green, narrowing below into a slender grooved petiole, sheathed at the base, blackish-purple.

Peduncle, with pedicel, 2 or $2\frac{1}{2}$ inches long, terete, slender, pale green, ascending from the base of the petiole, with two pale green or blackish sheathing bracts ; flowering bract about $\frac{1}{2}$ inch long, carinate, apiculate, sheathing, with a minute rudimentary bud within at the base.

Ovary $\frac{1}{4}$ inch long, with six rounded angles, green, with minute black dots.

Sepals cohering nearly equally for about $\frac{1}{4}$ inch, forming a wide tube, slightly gibbous beneath ; dorsal sepal ovate for about $\frac{1}{2}$ inch, 3-nerved, cucullate ; lateral sepals cordate, 3-nerved, margins reflexed ; all bright clear yellow, with numerous minute crimson spots and crimson nerves, and terminating in slender greenish-yellow tails $1\frac{3}{4}$ or 2 inches long.

Petals about $\frac{1}{8}$ inch long, oblong, anterior margin winged and angled, apex dentate, pale yellow.

Lip nearly $\frac{1}{4}$ inch long, united to the foot of the column by an extremely flexible hinge, margins of basal half so much reflexed as to meet at the back, anterior half triangular, margins crenate, pale transparent yellow, with minute crimson spots, apex reflexed, covered with minute crimson hairs.

Column about $\frac{1}{8}$ inch long, broadly winged, very pale pink, spotted and bordered with rose-pink, apex dentate.

THE only localities recorded as the habitat of *M. Wageneriana* are in Venezuela, where it was discovered by Moritz in February, 1849, growing on trees in the German Colony of Tovar. In July of the following year it was found by Wagener at an elevation of 6,000 feet near Carabobo, a village about nine miles south-west of Valencia, in Venezuela. Wagener's imported plants flowered at Brussels in 1851 under the care of Mons. Linden, for the first time in cultivation. From these specimens a drawing was published by Professor Reichenbach in 1858 in "Xenia Orchidacea." The woodcut in Paxton's "Flower Garden" represents a flower with the sepals tightly closed together, and is evidently drawn from a faded specimen.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig, 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—2a, side of petal ;—3, lip, front view ;—3a, lip, back view ;—4, column ;—4a, apex of column ; *all enlarged ;*—5, apex and section of leaf, *natural size.*

Florence H. Woolward del. et lith. 1892.

M&N. Hanhart imp.

MASDEVALLIA XANTHINA *Rchb. f.*

MASDEVALLIA XANTHINA Rchb. f.

Masdevallia xanthina Rchb. f. Gard. Chron. 1880, pt. I., p. 681; 1881, pt. I., p. 720 *(under M. Wageneriana Lindl.)*; pt. II., p. 409; 1883, pt. I., p. 598; Veitch Manual Orch. pt. V. (1889) p. 42 (*as M. Estradæ var. xanthina*).

Var. pallida, var. nov.

Leaf $2\frac{1}{2}$ or 3 inches long, and about $\frac{3}{4}$ inch wide, oblong-ovate, carinate, apex sharply tridenticulate, dull green, narrowing below into a slender grooved petiole, sheathed at the base and stained with black.

Peduncle nearly 3 inches long, slender, erect, terete, with one or two sheathing bracts, very pale green; flowering bract $\frac{3}{8}$ inch long, 3-nerved, sheathing below, apiculate, brown or blackish-green, with a minute rudimentary bud within at the base.

Ovary about $\frac{1}{4}$ inch long, curved, with six rounded angles, whitish-green.

Sepals cohering only at the base, about $\frac{3}{4}$ inch long; dorsal sepal 5-nerved, obovate, cucullate, margin recurved at the base, brilliant yellow, the nerves greenish at the back, tapering into a slender tail $1\frac{1}{4}$ or $1\frac{1}{2}$ inch long, orange at the apex, greenish at the base; lateral sepals oblong, 3-nerved, brilliant yellow, with a dark crimson blotch at the base of each, terminating in slender tails 1 inch or $1\frac{1}{4}$ inch long, orange at the apex, greenish at the base.

Petals about $\frac{1}{8}$ inch long, oblong, with an incurved keel on the anterior margin, apex tridentate, ivory-white, semi-transparent.

Lip about $\frac{1}{8}$ inch long, oblong, fleshy and grooved at the base, and united to the curved foot of the column by a flexible hinge, margin recurved, semi-transparent, pale yellow minutely dotted with crimson, apex recurved, with a small cushion of extremely minute dark crimson papillæ.

Column equalling the petals, broadly winged, white, bordered with crimson and spotted with crimson on the wings, apex and foot, apex acutely tridentate.

NO record is published of the locality in which *Masdevallia xanthina* was first found, or of the name of its discoverer. The specimens described by Professor Reichenbach in 1880 were supplied to him by Messrs. Veitch, who, however, were unable to give any information as to its origin.

By some botanists *M. xanthina* is considered to be merely a variety of *M. Estradæ*, but Consul Lehmann, who has had ample opportunity of examining and comparing both plants in their native habitat, is strongly opposed to this theory, and declares them to be specifically distinct, *M. xanthina* being in itself a very variable species, ranging over a geographical area of at least six hundred miles from north to south.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf;—6, *var. pallida*, from a drawing by Consul Lehmann;—7, ripe seed-capsule from a plant at Newbattle Abbey; *all natural size.*

The numerous names of localities mentioned below by Consul Lehmann, most of them not being marked in any map yet published, will probably convey but little information to any person unacquainted with the district. It is hoped, however, that with his assistance all these names will be indicated in the map intended for publication with the final chapters of the present work.

Masdevallia xanthina is found in the States of Colombia and Ecuador, in very numerous localities. It grows near the ground upon the trunks of oaks and other trees, in dense and very damp woods, at an elevation of 1,800 to 2,500 mètres (5,850 to 8,125 feet), flowering in October and November. Of all known species of *Masdevallia*, *M. xanthina* has the most extensive geographical distribution. The following are the principal localities in which I have observed it:

In the Province of Antioquia, Colombia:—In park-like woods near Oliconia and Amaga; on the Rio Chico and the Rio Grande, and on the Highlands of San Pedro and Santa Rosa; around La Palma and on the Alto de San Miguel near Medellin, and on oak trees in great abundance about the Roblarcito near Sonson.

In the Province of Cauca, Colombia:—About La Ceja near Inzá, and in the vicinity of the Rio Coquiyó and Lame on the western declivities of the Central Cordillera of Popayán; near Poblazón, Paisbamba, and on the western slopes of the volcano of Sotará; in the vicinity of Pansitorá and Almaguer, and from hence in an uninterrupted line along the Pisatumba, Zayo, Achupaya, Mamendoi, La Cruz, and Aponte, as far as the Páramo de Cebollas near Pasto.

In Ecuador:—On the south-western slopes of the Páramo de Mojanda, Province of Quito, and at Chiguinda on the eastern slopes of the Eastern Andes of Cuenca.

Still further south, on the eastern Andes of Loja, I observed a few years ago some plants which probably belonged to this species, but as I found no flowers, it must remain an open question whether *M. xanthina* extends as far south.

It is generally a very abundant species, and especially so in the district between Popayán and Pasto, but the plants rarely attain large proportions. Shade and constant dampness are essential to the growth of *M. xanthina*, and the entire area of its distribution is remarkable for these characteristics. The number of days without rainfall is very small throughout the year. The annual average temperature of the region ranges between 14° and 18° Centigrade (about 57° to 64° Fahrenheit).

The extensive geographical distribution of *M. xanthina* causes considerable variation in the size and colour of the flowers, but this variation is not sufficient to justify the opinion that *M. Estradæ* is only a variety of this species, although in some places in Antioquia the two plants are to be found growing together. The only form of *M. xanthina* known in cultivation comes from Antioquia, where the flowers are smallest, and generally of a bright apricot yellow colour. Further south, in the province of Cauca, they become larger, and paler in colour. In plants growing on the volcano of Sotará and at Paisbamba near Popayán, the flowers are nearly pure white, and have not the purple spot at the base of the lateral sepals, which is a constant feature in the flowers from all other localities. The Quito variety is the most floriferous, and the flowers rise freely above the large, densely tufted masses of leaves. The largest-flowered variety grows on the Eastern Andes of Cuenca, but the flowers are dull yellowish-white, and sometimes speckled with very minute brownish dots.

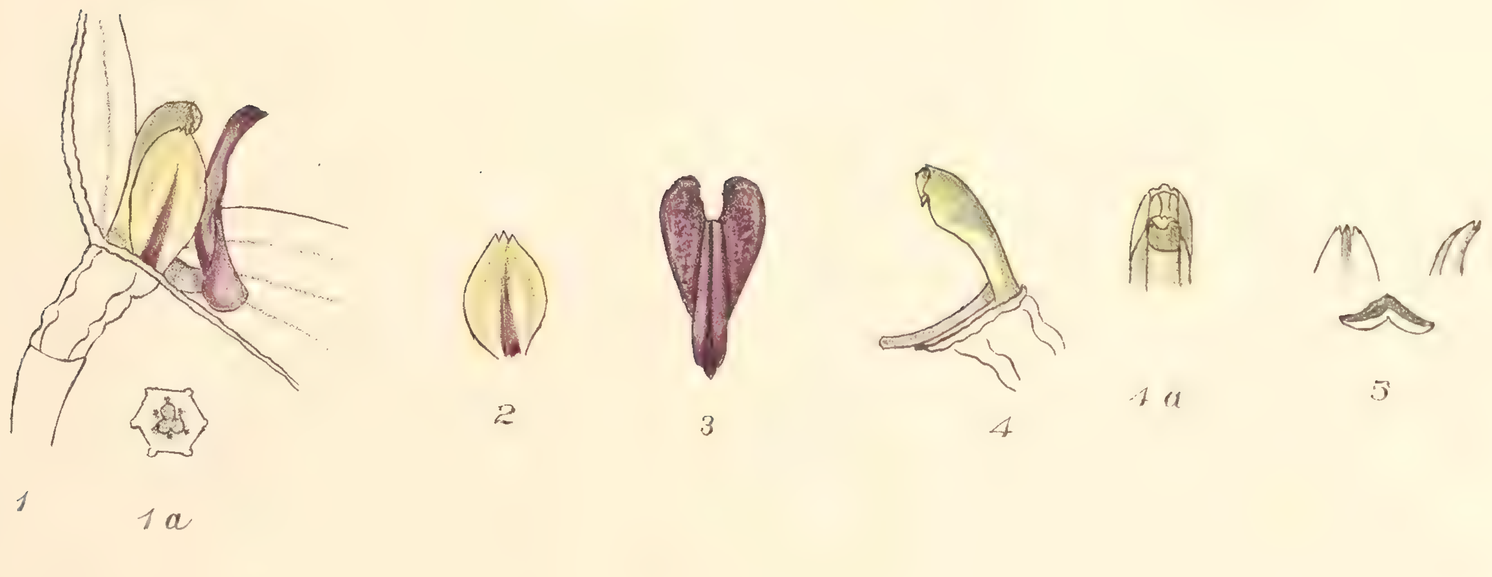
SECTION XIV.

TRIARISTELLÆ Rchb. f.

THE plants of this Section are distinguished by their small linear leaves, wire-like flower-stems, and boat-shaped lateral sepals, cohering for almost their entire length, the dorsal sepal being united to them for only a short distance near the base. Several species are known only in Herbaria, and have never been named or described.

3 species figured :

Masdevallia gemmata Rchb. f. (=*M. trichæte Rchb. f.*)
triaristella Rchb. f. (=*M. tridactylites Rchb. f.*)
triglochin Rchb. f.



Florence H Woolward del et lith 1894

MASDEVALLIA GEMMATA *Rchb .f.*

Goater imp

MASDEVALLIA GEMMATA Rchb. f.

MASDEVALLIA GEMMATA Rchb. f. Gard. Chron. 1883, pt. II., p. 294; Orchidophile (Godefroy) 1884, p. 36; Veitch Manual Orch. pt. V. (1889), p. 44.

M. trichæte Rchb. f. Gard. Chron. 1883, pt. II., p. 360; Orchidophile (Godefroy) 1884, p. 223; Veitch Manual Orch., pt. V. (1889), p. 44.

Leaf 1½ or 2 inches long, linear, fleshy, grooved on the upper side, apex tridenticulate, narrowing below into a slender terete petiole, sheathed at the base, dull green, often deeply tinged with reddish-purple.

Peduncle nearly 3 inches long, terete, thread-like or wiry, ascending or lateral from the base of the petiole, producing two or three flowers in succession, with one or two closely-sheathing bracts, dull reddish-green; flowering bract about ⅛ inch long, ovate, apiculate, sheathing below, dull green or brownish.

Ovary about ⅛ inch long, with six rounded angles, sometimes crenate, dull green.

Sepals: dorsal sepal united to the lateral sepals only near the base, free portion triangular-ovate for about ¼ inch, 3-nerved, cucullate, reddish-yellow, veined with crimson, and terminating in a slender yellow tail about ¾ inch long; lateral sepals cohering for ¾ inch, boat-shaped, 3-nerved, terminating in slender yellow tails about ½ inch long, dull reddish, shaded and veined with crimson.

Petals ⅛ inch long, oval, apex tridentate, pale yellow, with a crimson central streak.

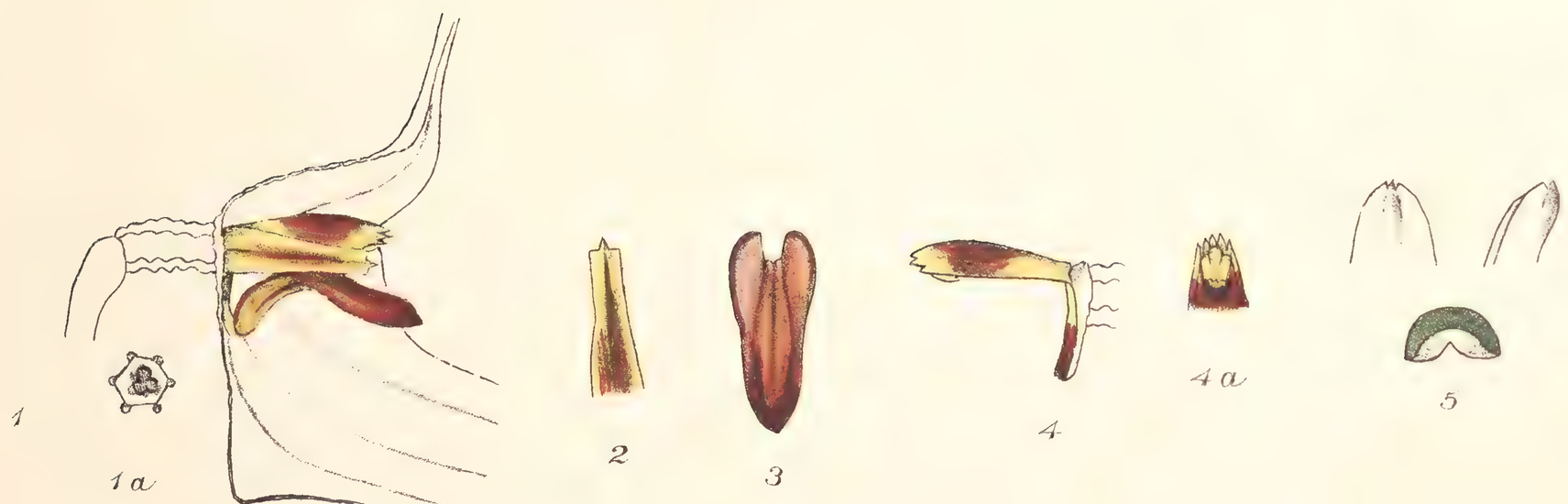
Lip longer than the petals, united to the foot of the column by a flexible hinge, cordate, with three longitudinal lines, margins and apex reflexed, mauve-purple, shaded and spotted with crimson.

Column a little longer than the petals, narrowly winged, apex denticulate, yellow tipped with green, the foot pink.

IMPORTED by Mr. F. Wallace, of Colchester, and named by Professor Reichenbach in 1883, with no record of its habitat.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column;—5, apex and section of leaf; *all enlarged*.



Florence H Woolward del et lith 1894.

MASDEVALLIA TRIARISTELLA *Rchb.f.*

MASDEVALLIA TRIARISTELLA Rchb. f.

MASDEVALLIA TRIARISTELLA Rchb. f. Gard. Chron. 1876, pt. II., pp. 226 and 559, fig. 108 ; Bot. Mag. t. 6268 (1876) ; Veitch Manual Orch., pt. V. (1889), p. 66.

M. tridactylites Rchb. f. Gard. Chron. 1883, pt. I., p. 784 ; Veitch Manual Orch., pt. V. (1889), p. 66.

Leaf about 2 inches long, growing in dense tufts, linear, channelled, very coriaceous, apex rounded and tridenticulate, green tinged with purple, narrowing below into a slender grooved petiole, sheathed at the base.

Peduncle 3 or 4 inches long, slender and wiry, ascending from within a sheath at the base of the petiole, in some specimens rough with minute warts, with two closely-sheathing bracts, producing two or three flowers in succession, dull brownish-green ; flowering bract minute, ovate, apiculate, sheathing below, pale green.

Ovary $\frac{1}{8}$ inch long, with six crenate wings, pale green tinged with red.

Sepals : dorsal sepal united to the lateral sepals for a little more than $\frac{1}{8}$ inch, free portion ovate, cucullate, 3-nerved, the central nerve carinate on the outer surface, terminating in a slender club-shaped yellow tail ; lateral sepals cohering for their entire length, more than $\frac{1}{2}$ inch, linear, boat-shaped, 3-nerved, each sepal diverging into a slender club-shaped yellow tail ; all the sepals yellow, veined and tinged with red.

Petals about $\frac{1}{8}$ inch long, linear-oblong, tridentate, yellow, with a broad red central streak.

Lip longer than the petals, deeply bi-lobed at the base, and united by a flexible hinge to the foot of the column, tongue-shaped, curved, with two obscure longitudinal keels, red, the margin and apex darker red.

Column club-shaped, narrowly winged, apex denticulate, yellow and red.

MASDEVALLIA TRIARISTELLA was discovered in Costa Rica in 1875, by Endres, who sent plants to Messrs. Veitch. Professor Reichenbach founded from it a new section, "*Triaristellæ*," of which it was the first species, and which now includes three or four more recently discovered plants.

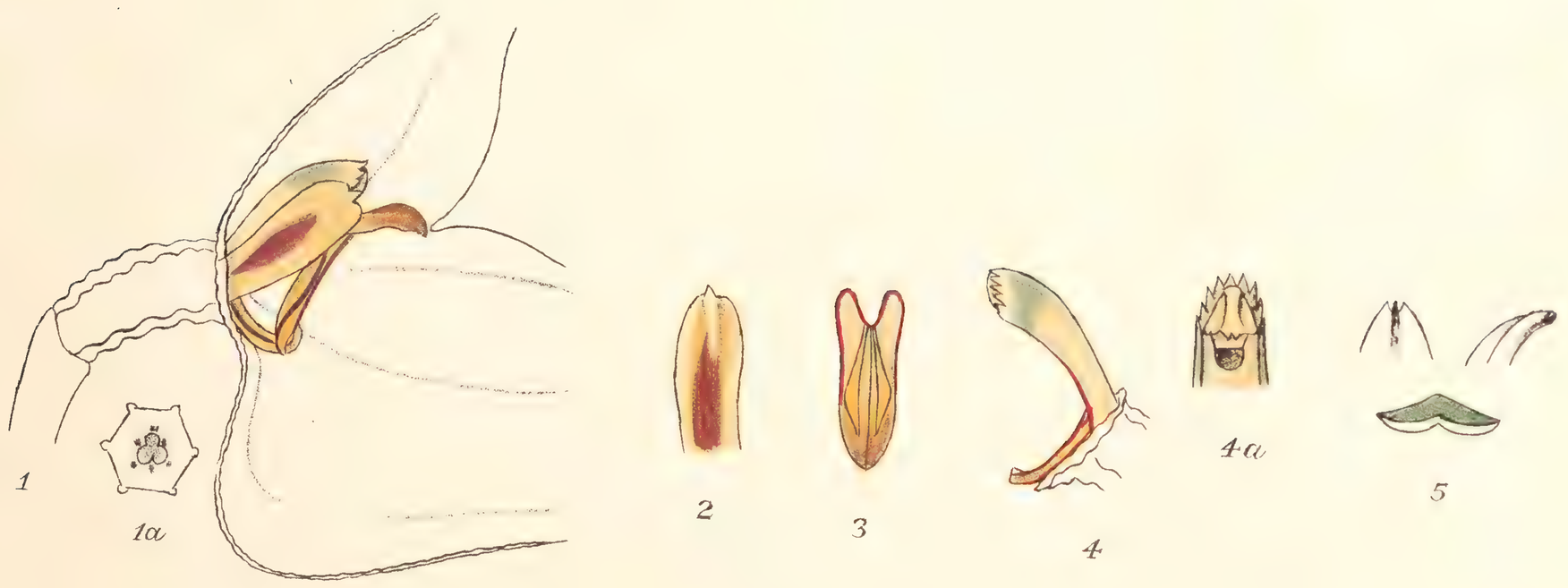
M. tridactylites, named and described by Reichenbach in 1883, is identical with *M. triaristella*. The species is a variable one, sometimes developing flower-stems five or six inches in length, with long, slender, dull-red flowers. The leaves apparently do not vary much in length, but in the long-stalked plants they are more slender. The small rough warts upon the flower-stems are not a constant feature. I have seen plants with no sign of them, and others in which they were very noticeable, although the leaves and flowers of all the plants were alike in colour and size.

Consul Lehmann informs me that *M. triaristella* grows in great abundance on the mountains of San Cristobal and near the sources of the river Reventazon, near Cartago, Costa Rica, at an elevation of 1,600 to 2,000 mètres (5,200 to 6,500 feet)—in fact, in nearly the same locality as *M. Reichenbachiana*.

Explanation of Plate, drawn from a plant at Newbattle Abbey :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ;—5, apex and section of leaf ; *all enlarged.*

64



Florence H. Woolward del et lith. 1896

Goater Imp.

MASDEVALLIA TRIGLOCHIN *Rchb. f.*

MASDEVALLIA TRIGLOCHIN Rchb. f.

MASDEVALLIA TRIGLOCHIN Rchb. f. Gard. Chron. 1877, pt. II., p. 648 ; 1881, pt. II., p. 409 ; Otia. Bot. Hamb. p. 14 (1878) ; Garden, 1880, pt. II., p. 614 ; 1890, pt. II., p. 475.

Leaf about 1¼ inch long, linear, fleshy, apex tridenticulate, narrowing below into a grooved petiole, sheathed at the base, dull purplish-green.

Peduncle about 2 inches long, terete, wiry, studded with minute asperities, ascending from the base of the petiole, bearing two or three flowers in succession, each having a minute membranous apiculate bract at the base of the pedicel, dull brownish-green.

Ovary ⅛ inch long, hexagonal, with six crenate wings, dull green.

Sepals : dorsal sepal united to the lateral sepals for ⅛ inch, free portion triangular-ovate for about ¼ inch, 3-nerved, cucullate, terminating in a slender yellow tail ½ inch long ; lateral sepals cohering for nearly ¾ inch, boat-shaped, 3-nerved, terminating in slender yellow tails ⅜ inch long ; all dark reddish-yellow shaded and veined with dark red.

Petals scarcely ⅛ inch long, oblong, apiculate, orange-yellow, with a broad crimson central streak.

Lip longer than the petals, united to the foot of the column by a flexible hinge, oblong-cordate, with two angled longitudinal lines, dull orange-yellow, margined with red.

Column a little longer than the petals, narrowly winged, apex denticulate, yellow and green, the base and foot edged with red.

MASDEVALLIA TRIGLOCHIN was discovered by Consul Lehmann at Quito, in the north of Ecuador, at an elevation of 5,500 feet. Living plants were sent by him to Messrs. Low, of Clapton, and first flowered in 1877, supplying the specimens named and described by Professor Reichenbach. Since its first introduction, this curious little plant has become very scarce in cultivation, and has almost died out, even in the most complete collections of Masdevallias. For the specimen here figured, I am indebted to Mr. F. W. Moore, of the Royal Botanic Gardens, Glasnevin, Dublin.

Explanation of Plate :

Fig. 1, petal, lip, and column, in natural position ;—1a, section of ovary ;—2, petal, inner side ;—3, lip ;—4, column ;—4a, apex of column ;—5, apex and section of leaf ; *all enlarged.*

SECTION XV.

TUBULOSÆ Rchb.

THE species included in this Section are remarkable for the very long narrow tube formed by the sepals. By the advice of Consul Lehmann I place *M. rosea* in this group with *M. ventricularia.*

2 species figured :

Masdevallia rosea Lindl.
ventricularia Rchb. f. *(not in cultivation.)*

Not in cultivation :

M. constricta Poepp. et Endl. Nov. Gen. et Sp. II. (1838), p. 6. pl. 108.
tubulosa Lindl. Orch. Lind. (1846), p. 4.
ventricularia Rchb. f. *(see Plate.)*

65

Florence H. Woolward. del. et lith. 1889.

Hanhart imp.

MASDEVALLIA ROSEA *Lindl.*

MASDEVALLIA ROSEA Lindl.

Masdevallia rosea Lindl. Ann. and Mag. Nat. Hist. XV. (1845), p. 257; Bonplandia II. (1854), p. 116; Walp. Ann. VI. (1861), p. 192; Belg. Hort. XXIII. (1873), p. 360; Otia Bot. Hamb. (1878), p. 14; Gard. Chron. 1880, pt. I., pp. 554, 648, 680 and 681, figs. 117 and 118; 1881, pt. II., p. 337, fig. 63; 1882, pt. I., pp. 628 and 644, fig. 101; Orchidophile (Godefroy) 1882, p. 397; 1886, p. 235.

Leaf 5 or 6 inches long and about 1 inch wide, oblong-lanceolate, carinate, acutely tridenticulate, bright green, narrowing below into a slender grooved petiole, closely sheathed at the base.

Peduncle 5 or 6 inches long, very slender, terete, erect, pale green, with one or two sheathing bracts; flowering bract $\frac{3}{8}$ inch long, sheathing, apiculate, brownish.

Ovary about $\frac{1}{4}$ inch long, triangular, with rounded angles, light green, sometimes brown or blackish.

Sepals: dorsal sepal united to the lateral sepals for about $1\frac{1}{4}$ inch, forming a narrow tube, bright red and shining on the outer surface and shaded with rose-lilac, free portion triangular for $\frac{1}{8}$ inch, rose-lilac, tapering into a very slender tail 1 or $1\frac{1}{4}$ inch long, bright red; lateral sepals cohering for $1\frac{3}{4}$ inch, free portions oblong for about 1 inch, bright rose-lilac veined with dark rose, terminating in slender bright red tails $\frac{3}{8}$ or $\frac{1}{2}$ inch long.

Petals $\frac{3}{16}$ inch long, ligulate, angled on both margins near the base, apex tridenticulate, very pale yellow.

Lip $\frac{3}{16}$ inch long, pandurate, pale yellow and slightly hairy at the base, with two pink longitudinal keels, apex dark reddish-purple, covered with stiff hairs.

Column nearly $\frac{1}{4}$ inch long, narrowly winged, apex denticulate, white.

MASDEVALLIA ROSEA was discovered in 1842 or 1843, by Theodore Hartweg, near Loja in Ecuador, and from dried specimens collected by him it was first named and described by Dr. Lindley in 1845. No importation of living plants was effected until 1880, when Consul Lehmann succeeded in bringing home a quantity. In 1882, the first living flowers seen in Europe were produced from these plants distributed among various private collections of Orchids. The flower varies slightly in size and in brilliancy of colour, and the plant drawn for the accompanying plate was considered by Professor Reichenbach to be a rather narrow and dark-flowered variety. The stem is usually one-flowered, although in a wild state stems bearing two and even three flowers have been met with, and have also occasionally appeared in cultivated plants.

Consul Lehmann sends me the following note:

Masdevallia rosea grows on the Eastern Andes from the southern part of Colombia to the south of Ecuador at an elevation of 2,800 to 3,200 mètres (9,100 to 10,400 feet). In 1877 I met with it on the Volcano Tunguragua, and subsequently in the Eastern Andes of Cuenca and Loja, in the south of Ecuador. It grows on trees in dense and damp woods. The annual mean temperature of the region ranges between 10° and 12°·5 Centigrade (50° to 54° Fahrenheit).

The only plants existing in Europe originate from an importation of mine made in 1880, from the Andes of Pasto in Colombia. In its natural habitat the plant flowers in October and November, and also in June, July and August.

F. C. Lehmann.

Explanation of Plate, drawn from a plant at Newbattle Abbey:

Fig. 1, petal, lip, and column, in natural position;—1a, section of ovary;—2, petal, inner side;—3, lip;—4, column;—4a, apex of column; *all enlarged*;—5, apex and section of leaf, *natural size*.

8 b

F.C. Lehmann del.

MASDEVALLIA VENTRICULARIA *Rchb. f.*

Hanhart lith et imp.
1894.

MASDEVALLIA VENTRICULARIA Rchb. f.

Masdevallia ventricularia Rchb. f. Otia Bot. Hamb. (1878), p. 14.

Leaf 5 or 6 inches long, oblong-lanceolate, apex tridenticulate, narrowing below into a slender grooved petiole, sheathed at the base, bright green.

Peduncle 2 or 3 inches long, terete, slender, with two sheathing bracts, bright green, ascending from within the sheath at the base of the petiole; flowering bract $\frac{3}{8}$ inch long, membranous, apiculate, sheathing below, brownish.

Ovary $\frac{1}{4}$ inch long, with six grooves, green shaded with brown.

Sepals cohering for about $2\frac{1}{2}$ inches, forming a narrow inflated tube, yellow at the base, free portions triangular-ovate for $\frac{3}{8}$ inch, the dorsal one cucullate, the lateral ones angled at their junction, all rich brownish-crimson, with numerous darker streaks, and terminating in slender yellow tails 1 to 3 inches long.

Petals oblong, curved, apiculate, angled on the anterior margin, white, with a few crimson spots.

Lip oblong-ovate, with two longitudinal keels, and united to the foot of the column by a hinge, dull purple.

Column a little shorter than the petals, erect, apex denticulate, white.

ALTHOUGH *M. ventricularia* was discovered by Dr. Jameson, during his travels in Ecuador, it was not from his specimens that Reichenbach named and described the plant. In 1877 it was found again by Consul Lehmann, on the western slopes of the mountains of Calacalí, near Quito, and he informs me that it was upon the small short-tailed form, fig. 5 of the accompanying Plate, that Reichenbach bestowed the name, and from which he wrote his description. It has never been in cultivation, and is, even in its native habitat, a rare species, confined to small areas in only a few localities. Several varieties exist, the extremes of which are well shown in the graceful drawing supplied for the present work by Consul Lehmann, who has had unusual opportunities of observing the plant. He first found it at Anque near Quito, represented by the short-tailed variety (fig. 5), and again on the western slopes of the Cerro del Corazón between the Puente de Yamboya and Milligallé. The long-tailed variety was found by him at the Farallones de Cali in the Province of Cauca, and other slightly differing forms exist at Frontino in Antioquia and on the Alto de Loaiza, Cauca. It grows most frequently upon the thin liana-like branches of *Psammisia*, *Eurygania*, and other Vacciniaceous shrubs, and sometimes also quite near the ground on the trunks of decaying trees in damp shady forests, at an elevation of 1,800 to 2,200 mètres (5,850 to 7,160 feet) above sea-level.

Explanation of Plate, from a drawing by Consul Lehmann:

Fig. 1, petal, lip, and column, *natural size*;—2, lip;—2a, back of lip;—3, petal, inner side;—3a, petal, outer side;—4, petal and column, *much enlarged*;—5, type of the flower first named by Reichenbach.

SECTION INDETERMINATE:

SO little is known about the following species that it is impossible to class them in any Section.

Masdevallia aureolutea, Orchidophile (Godefroy) vol. I. (1881-3), p. 84.
cœsia Roezl, Orchidophile (Godefroy) vol. I. (1881-3), p. 599.
fasciata Rchb. f. Gard. Chron. 1881, pt. I., p. 202.
galeata, Lind. Cat. 1873.
Guyanensis Lindl. Hook. Lond. Journ. Bot. II. (1843), p. 673.
hæmatosticta Rchb. f. Flora (Singer) 1886, p. 559.
heteroptera Rchb. f. Gard. Chron. 1875, pt. I., p. 590.
meiracyllium Rchb. f. Flora (Singer) 1886, p. *558.*
mordax Rchb. f. Flora (Singer) 1886, p. 559.
Païvæana Rchb. f. Xen. Orch. III. (1878), p. 25.
Klabochorun Rchb. f. Gard. Chron. 1875, pt. II., p. 720.
Sprucei Rchb. f. Otia Bot. Hamb. (1878) p. 17.
strumifera Rchb. f. Flora (Singer) 1886, p. 560.
Surinamensis Focke Tijdschr. voor. Naturw. IV. (1851), p. 62.
tricolor Rchb f. Linnœa XXII. (1849), p. 818.

SPECIES

NOW EXCLUDED FROM THE

GENUS MASDEVALLIA.

M. amethystina Rchb. f. Otia Bot. Hamb. (*1878*), *p. 14* (*Scaphosepalum*).
anchorifera Rchb. f. Gard. Chron. 1884, pt. I., p. 577 (*Scaphosepalum*).
auriculigera Rchb. f. Gard. Chron. 1871, p. 1569 (*Pleurothallis*).
aviceps Rchb. f. Otia Bot. Hamb. (*1878*), *p. 93* (*Pleurothallis*).
brevis Rchb. f. Gard. Chron. 1883, pt. II., p. 588 (*Scaphosepalum*).
culex, hort. Gard. Chron. 1881, pt. II., p. 6 (*Pleurothallis Barberiana*).
Dayana Rchb. f. Gard. Chron. 1880, pt. II., p. 295 (*Cryptophoranthus*).
Echidna Rchb. f. Bonplandia III. (*1855*), *p. 69* (*Scaphosepalum*).
erinacea Rchb. f. Linnæa XLI. (*1877*), *p. 11* (*Scaphosepalum*).
fenestrata Lindl. Bot. Mag. t. 4164 (*1845*) (*Cryptophoranthus*).
gibberosa Rchb. f. Gard. Chron. 1876, pt. I., p. 8 (*Scaphosepalum*).
glossapogon, hort. Veitch (*Pleurothallis*).
gracilenta Rchb. f. Gard. Chron. 1875, pt. II., p. 98 (Pleurothallis).
hypodiscus Rchb. f. Gard. Chron. 1878, pt. II., p. 234 (*Pleurothallis*).
Livingstoniana Roezl Gard. Chron. 1874, pt. II., p. 322 (*Pleurothallis*).
macrodactyla Rchb. f. Gard. Chron. 1872, p. 571 (*Scaphosepalum*).
ochthodes Rchb. f. Bonplandïa III. (*1855*), *p. 70* (*Scaphosepalum*).
platyrhachis Rolfe Gard. Chron. 1888, pt. II., p. 178 (*Pleurothallis*).
pulvinaris Rchb. f. Gard. Chron. 1880, pt. I., p. 200 (*Scaphosepalum*).
punctata Rolfe Gard. Chron. 1888, pt. II., p. 323 (*Scaphosepalum*).
swertiæfolia Rchb. f. Gard. Chron. 1880, pt. II., p. 390 (*Scaphosepalum*).
verrucosa Rchb. f. Linnæa XXII. (*1849*), *p. 819* (*Scaphosepalum*).
xipheres Rchb. f. Linnæa XLI. (*1877*), *p. 12* (*Scaphosepalum*).

INDEX

TO THE

GENUS MASDEVALLIA.

THE Plates in this work were not issued with any regard to final arrangement, but according to the flowering of the plants and the completion of the drawings, and they are, therefore, not numbered. As the Genus is divided into Sections, which there is no reason for placing in any particular order, they are numbered, and are, as well as the Plates contained in each Section, arranged alphabetically. Each name in the index refers to the number and name of the Section to which the plant is assigned, or, if a synonym, to the accepted name of the plant. The names of all species and varieties not figured in the book are printed in italics, and to those now excluded from the Genus Masdevallia, the names of the Genera in which they are classed are added.

M. abbreviata, Section I. Amandæ.
acrochordonia, var. see Ephippium.
æquiloba,=civilis.
affinis, Section III. Coriaceæ.
albida,=infracta.
amabilis, Section II. Coccineæ.
Amanda, Section I. Amandæ.
Amesiana, × *see* Tovarensis.
amethystina, Scaphosepalum.
anachœte, Section I. Amandæ.
anchorifera, Scaphosepalum.
angulata, Section III. Coriaceæ.
approviata, var. see ionocharis.
aristata, Section VIII. Polyanthæ.
Arminii, Section XIII, Triangulares.
astuta, var. see erythrochæte.
atropurpurea,=auropurpurea.
attenuata, Section VI. Minutæ.
aurantiaca, Section VIII. Polyanthæ.
aurantiaca, var. see militaris.
aurantiaca, var. see Reichenbachiana.
aurea, var. of militaris.
aureolutea, Section indeterminate.
auriculigera, Pleurothallis.
auropurpurea, Section VIII. Polyanthæ.
aviceps, Pleurothallis.

Backhousiana, var. Section XI. Saccolabiatæ.
Barlæana, Section II. Coccineæ.
M. bella, Section XI. Saccolabiatæ.
Benedicti,=Houtteana.
bicolor, see maculata.
biflora,=caloptera.
Boddaerti, var. see militaris.
Bonplandii, Section III. Coriaceæ.
brevis, Scaphosephalum.
Bruchmülleri,=coriacea.
Buccinator, Section VIII. Polyanthæ.
Burbidgeana, var. of Chimæra.

caesia, Section indeterminate.
caloptera, Section I. Amandæ.
calopterocarpa, Section I. Amandæ.
calura, Section X. Reichenbachianæ.
calyptrata, Section IV. Cucullatæ.
campyloglossa, Section III. Coriaceæ.
candida,=Tovarensis.
Carderi, Section XI. Saccolabiatæ.
caudata, Section III. Triangulares.
caudata-Estradæ, × *see* caudata.
Cayennensis, Section III. Coriaceæ.
Chelsoni, × *see* Veitchiana.
Chestertonii, Section XI. Saccolabiatæ.
Chimæra, Section XI., Saccolabiatæ.
chloracra, Section III. Coriaceæ.
Chontalensis, Section VI. Minutæ.
cinnamomea, Section VIII. Polyanthæ.
citrina, var. see militaris.
civilis, Section III. Coriaceæ.

M. coccinea, Section II. Coccineæ.
Colibri,=Ephippium.
constricta, Section XV. Tubulosæ.
coriacea, Section III. Coriaceæ.
corniculata, Section IV. Cucullatæ.
Costaricensis, = marginella.
Courtauldiana, × *see* caudata.
crassicaudata, var. see polysticta.
cucullata, Section IV. Cucullatæ.
culex, Pleurothallis.
cuprea, Section VIII. Polyanthæ.
cupularis, Section III. Coriaceæ.
curtipes, Section VIII. Polyanthæ.

Davisii, Section II. Coccinæ.
Dayana, Cryptophoranthus.
demissa, Section X. Reichenbachianæ.
dolosa, var. of Chimæra.

Echidna, Scaphosepalum.
Eduardi, Section IX. Racemosæ.
elephanticeps, Section III. Coriaceæ.
elephanticeps var. pachysepala, = Mooreana.
ellipes, Section III. Coriaceæ.
Ellisiana, x *see* militaris.
ensata, Section III. Coriaceæ.
Ephippium, Section VIII. Polyanthæ.
erinacea, Scaphosepalum.
erythrochæte, Section XI. Saccolabiatæ.
Estradæ, Section XIII. Triangulares.
expansa, Section XIII. Triangulares.

falcago, Section V. Fissæ.
fasciata, Section indeterminate.
fenestrata, Cryptophoranthus.
flava, *var. see* maculata.
flaveola, Section VI. Minutæ.
floribunda, Section III. Triangulares.
Forgetiana, var. see infracta.
fractiflexa, Section III. Coriaceæ.
fragrans, Section III. Coriaceæ.
Fraseri, x *see* militaris.
fulvescens, Section X. Reichenbachianæ.

Gairiana, x *see* Veitchiana.
Galeata, Section indeterminate.
Galeottiana, = floribunda.
Gargantua, = elephanticeps.
M. Gaskelliana, var. see erythrochæte.
Geleniana, x *see caudata.*
gemmata, Section XIV. Triaristellæ.
gibberosa, Scaphosepalum.
glossapogon, Pleurothallis.
Gorgona, var. of Chimæra.
gracilenta, Pleurothallis.
Gustavi, Section I. Amandæ.
guttulata, Section VIII. Polyanthæ.
Guyanensis, Section indeterminate.

Harryana, *var. see* coccinea.
hæmatocantha, Section VIII. Polyanthæ.
hæmatosticta, Section indeterminate.
Heathii, x *see* militaris.
heteroptera, Section indeterminate.
heterotepala, Section III. Coriaceæ.
hians, Section VI. Minutæ.
hieroglyphica, Section XIII. Triangulares.
Hincksiana, x *see* Tovarensis.
Houtteana, Section XI. Saccolabiatæ.
hymenantha, Section XIII. Triangulares.
hypodiscus, Cryptophoranthus.

ignea, = militaris.
inæqualis, Section XIII. Triangulares.
inflata, var. see corniculata.
infracta, Section VIII. Polyanthæ.
ionocharis, Section XIII. Triangulares.

Klabochorum, Section indeterminate.

lævis, Section III. Coriaceæ.
Lansbergii, Section VI. Minutæ.
lata, Section VIII. Polyanthæ.
Laucheana, Section III. Coriaceæ.
Lehmanni, Section I. Amandæ.
leontoglossa, Section III. Coriaceæ.
lepida, Section III. Coriaceæ.
Lindeni, = coccinea.
Lindeniana, = floribunda.
Livingstoniana, Pleurothallis.
longicaudata, = infracta.
Lowii, = trinema.
lubibunda, var. see Estradæ.

macrochila, = Chestertonii.
macrodactyla, Scaphosepalum.

M. macroglossa, Section III. Coriaceæ.
macrura, Section IV. Cucullatæ.
maculata, Section VIII. Polyanthæ.
marginella, Section X. Reichenbachianæ.
Marshalliana, var. see militaris.
Massangeana, var. see militaris.
Mastodon, Section VIII. Polyanthæ.
Measuresiana, × *see* Tovarensis.
meiracyllium, Section indeterminate.
melanopus, Section I. Amandæ.
melanoxantha, Section VIII. Polyanthæ.
meleagris, = picturata.
meleagris, Section indeterminate.
microglochin, Section XI. Saccolabiatæ.
militaris, Section II. Coccineæ.
minuta, Section VI. Minutæ.
molossus, Section XII. Saltatrices.
Mooreana, Section III. Coriaceæ.
mordax, Section indeterminate.
Mundyana, × *see* militaris.
muscosa, Section VII. Muscosæ.
myriostigma, = floribunda.

nidifica, Section VI. Minutæ.
Normanni, = Reichenbachiana.
nycterina, Section XI. Saccolabiatæ.

O'Brieniana, Section XII. Saltatrices.
ochthodes, Scaphosepalum.
ophioglossa, Section VI. Minutæ.
Ortgiesiana, Section III. Coriaceæ.

pachyantha, Section III. Coriaceæ.
pachyura, Section I. Amandæ.
Païvæana, Section XIII. Triangulares.
pallida, var. see Xanthina.
pardina, Section III. Coriaceæ.
Parlatoreana, × *see* Veitchiana.
Peristeria, Section III. Coriaceæ.
picturata, Section V. Fissæ.
platycrater, Section XI. Saccolabiatæ.
platyglossa, Section III. Coriaceæ.
platyrhachis, Pleurothallis.
polyantha, var. see Schlimii.
polysticta, Section I. Amandæ.
porcelliceps, Section III. Coriaceæ.
psittacina, = Houtteana.
pulvinaris, Scaphosepalum.
M. pumila, Section VI. Minutæ.
punctata, Scaphosepalum.
purpurea, var. see infracta.
pusilla, Section XI. Saccolabiatæ.
pusiola, Section VI. Minutæ.
racemosa, Section IX. Racemosæ.
radiosa, Section XI. Saccolobiatæ.
Reichenbachiana, Section X. Reichenbachianæ.
Roezlii, var. Section XI. Saccolabiatæ.
Rolfeana, Section X. Reichenbachianæ.
Rosea, Section XV. Tubulosæ.
rufolutea, = civilis.

Saltatrix, Section XII. Saltatrices.
Sceptrum, var. see Schlimii.
Schlimii, Section VIII. Polyanthæ.
Schroederiana, Section X. Reichenbachianæ.
senilis, var. of Chimæra.
severa, var. of Chimæra.
Shuttleworthii, = caudata.
simula, Section XII. Saltatrices.
sororcula, = Mooreana.
Spectrum, Section XI. Saccolabiatæ.
splendens, × *see* Veitchiana.
splendida, × *see* Veitchiana.
splendida, var. of Chimæra.
Sprucei, Section indeterminate.
Stobartiana, var. see militaris.
striatella, Section III. Coriaceæ.
strumifera, Section indeterminate.
Surinamensis, Section indeterminate.
swertiæfolia, Scaphosepalum.

torta, Section III. Coriaceæ.
Tovarensis, Section VIII. Polyanthæ.
triangularis, Section XIII. Triangulares.
triaristella, Section XIV. Triaristellæ.
trichæte, = gemmata.
tricolor, Section indeterminate.
tricolor, Section XIII. Triangulares.
tridactylites, = triaristella.
tridens, Section I. Amandæ.
tridentata, Section VIII. Polyanthæ.
triglochin, Section XIV. Triaristellæ.
trinema, Section XI. Saccolabiatæ.

M. triquetra, Section VIII. Polyanthæ.
Trochilus, = Ephippium.
Troglodytes, Section XI. Saccolabiatæ.
Tubeana, Section XI. Saccolabiatæ.
tubulosa, Section XV. Tubulosæ.

uncifera, Section V. Fissæ.
uniflora, Section XIII. Triangulares.
urostachya, Section VIII. Polyanthæ.

Veitchiana, Section II. Coccineæ.
velifera, Section III. Coriaceæ.
velutina, Section XIII. Triangulares.
ventricularia, Section XV. Tubulosæ.
verrucosa, Scaphosepalum.

M. Vespertilio, Section XI. Saccolabiatæ.

Wageneriana, Section XIII. Triangulares.
Wallisii, var. of Chimæra.
Wendlandiana, Section VI. Minutæ.
Winniana, var. of Chimæra.

xanthina, Section XIII. Triangulares.
xanthocorys, *var. see* caudata.
xanthodactyla, Section I. Amandæ.
xipheres, Scaphosepalum.
xylina, Section VIII. Polyanthæ.

Yauaperyensis, Section III. Coriaceæ.

FINIS.

INDEX

TO THE FIRST FIVE PARTS OF

"THE GENUS MASDEVALLIA."

M. abbreviata, - - Part 4.
„ *acrochordonia, see Ephippium.*
„ *æquiloba, see civilis.*
„ *albida, see infracta.*
„ amabilis, - - Part 1.
„ aristata, - - Part 4.
„ Arminii, - - Part 3.
„ *Backhousiana, see Chimæra.*
„ bella, - - - Part 1.
„ *Benedicti, see Houtteana.*
„ *Bruchmülleri, see coriacea.*
„ *candida, see Tovarensis.*
„ Carderi, - - Part 3.
„ caudata, - - Part 3.
„ Chestertonii, - - Part 1.
„ Chimæra, - - Part 5.
„ „ *var.* Backhousiana, Part 5.
„ „ *var.* Roezlii, - Part 5.
„ civilis, - - - Part 2.
„ coccinea, - - Part 3.
„ *Colibri, see Ephippium.*
„ coriacea, - - Part 3.
„ corniculata, - - Part 2.
„ cucullata, - - Part 2.
„ curtipes, - - Part 5.
„ Davisii, - - - Part 3.
„ demissa, - - Part 5.
„ Ephippium, - - Part 1.
„ Estradæ, - - Part 3.
„ floribunda, - - Part 4.
„ fragrans, - - Part 4.
„ *Galeottiana, see floribunda.*
„ guttulata, - - Part 4.
„ *Harryana, see coccinea.*
„ Houtteana, - - Part 5.
„ *ignea, see militaris.*
„ *inflata, see corniculata.*
„ infracta, - - Part 2.
M. ionocharis, - - Part 4.
„ leontoglossa, - - Part 2.
„ *Lindeni, see coccinea.*
„ *longicaudata, see infracta.*
„ *ludibunda, see Estradæ.*
„ macrura, - - Part 1.
„ maculata, - - Part 2.
„ melanopus, - - Part 4.
„ militaris, - - Part 4.
„ *myriostigma, see floribunda.*
„ nidifica, - - Part 5.
„ *Normanni, see Reichenbachiana.*
„ Peristeria, - - Part 1.
„ picturata, - - Part 2.
„ *polyantha, see Schlimii.*
„ polysticta, - - Part 3.
„ *psittacina, see Houtteana.*
„ racemosa, - - Part 4.
„ Reichenbachiana - Part 2.
„ *Roezlii, see Chimæra.*
„ Rolfeana, - - Part 5.
„ rosea, - - - Part 1.
„ *rufolutea, see civilis.*
„ *sceptrum, see Schlimii.*
„ Schlimii, - - Part 2.
„ *Shuttleworthii, see caudata.*
„ simula, - - - Part 1.
„ torta, - - - Part 1.
„ Tovarensis, - - Part 2.
„ triangularis, - - Part 3.
„ *Trochilus, see Ephippium.*
„ uniflora, - - Part 5.
„ Veitchiana, - - Part 1.
„ Wageneriana, - - Part 3.
„ xanthina, - - Part 4.
„ *xanthocorys, see caudata.*
„ Yauaperyensis, - - Part 5.

THE GENUS MASDEVALLIA.

ISSUED BY

THE MARQUESS OF LOTHIAN, K.T.,

CHIEFLY FROM PLANTS IN HIS COLLECTION OF

ORCHIDS AT NEWBATTLE ABBEY.

PART I.

CONTAINING

MASDEVALLIA	AMABILIS,	MASDEVALLIA	PERISTERIA,
,,	BELLA,	,,	ROSEA,
,,	CHESTERTONII,	,,	SIMULA,
,,	EPHIPPIUM,	,,	TORTA,
,,	MACRURA,	,,	VEITCHIANA.

Mo. Bot. Garden.

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ORCHIDS AT NEWBATTLE ABBEY.

PART II.

CONTAINING

MASDEVALLIA	CIVILIS,	MASDEVALLIA	MACULATA,
„	CORNICULATA,	„	PICTURATA,
„	CUCULLATA,	„	REICHENBACHIANA,
„	INFRACTA,	„	SCHLIMII,
„	LEONTOGLOSSA,	„	TOVARENSIS.

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1891

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THE GENUS MASDEVALLIA.

ISSUED BY

THE MARQUESS OF LOTHIAN, K.T.,

CHIEFLY FROM PLANTS IN HIS COLLECTION OF

ORCHIDS AT NEWBATTLE ABBEY;

PLATES AND DESCRIPTIONS BY

MISS FLORENCE H. WOOLWARD;

WITH ENGRAVINGS FROM PHOTOGRAPHS.

ADDITIONAL NOTES BY

CONSUL F. C. LEHMANN

(GERMAN CONSUL IN THE REPUBLIC OF COLOMBIA).

PART III.

CONTAINING

MASDEVALLIA	**ARMINII,**	**MASDEVALLIA**	**DAVISII,**
„	**CARDERI,**	„	**ESTRADÆ,**
„	**CAUDATA,**	„	**POLYSTICTA,**
„	**COCCINEA,**	„	**TRIANGULARIS,**
„	**CORIACEA,**	„	**WAGENERIANA.**

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PART IV.

CONTAINING

MASDEVALLIA ABBREVIATA,	MASDEVALLIA IONOCHARIS,
,, ARISTATA,	,, MELANOPUS,
,, FLORIBUNDA,	,, MILITARIS,
,, FRAGRANS,	,, RACEMOSA,
,, GUTTULATA,	,, XANTHINA.

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PART V.

CONTAINING

MASDEVALLIA CHIMÆRA,	MASDEVALLIA HOUTTEANA,
„ „ var. BACKHOUSIANA,	„ NIDIFICA,
„ „ var. ROEZLII,	„ ROLFEANA,
„ CURTIPES,	„ UNIFLORA,
„ DEMISSA,	„ YAUAPERYENSIS.

(WITH INDEX TO FIRST FIVE PARTS.)

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PART VI.

CONTAINING

MASDEVALLIA	ELEPHANTICEPS,	MASDEVALLIA	OPHIOGLOSSA,
„	FRACTIFLEXA,	„	PACHYANTHA,
„	HIEROGLYPHICA,	„	STRIATELLA,
„	MOOREANA,	„	VENTRICULARIA,
„	MUSCOSA,	„	WENDLANDIANA.

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PART VII.

CONTAINING

MASDEVALLIA	CALOPTERA,	MASDEVALLIA	RADIOSA,
„	GEMMATA,	„	TRIARISTELLA,
„	O'BRIENIANA,	„	TRINEMA,
„	PACHYURA,	„	TROGLODYTES,
„	PORCELLICEPS,	„	VELIFERA.

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PART VIII.

CONTAINING

MASDEVALLIA	AUROPURPUREA,	MASDEVALLIA	ERYTHROCHÆTE,
„	BARLÆANA,	„	LAUCHEANA,
„	CALURA,	„	ORTGIESIANA,
„	CAMPYLOGLOSSA,	„	PLATYGLOSSA,
„	CUPULARIS,	„	VESPERTILIO.

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PART IX.

(LAST PART.)

CONTAINING

MASDEVALLIA ATTENUATA, **MASDEVALLIA NYCTERINA,**

„ FULVESCENS, **„ PUSILLA,**

„ MARGINELLA, **„ SCHROEDERIANA,**

MASDEVALLIA TRIGLOCHIN.

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(WITH MAP, INDEX, ETC.)

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